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# 1982

## Census of Manufactures

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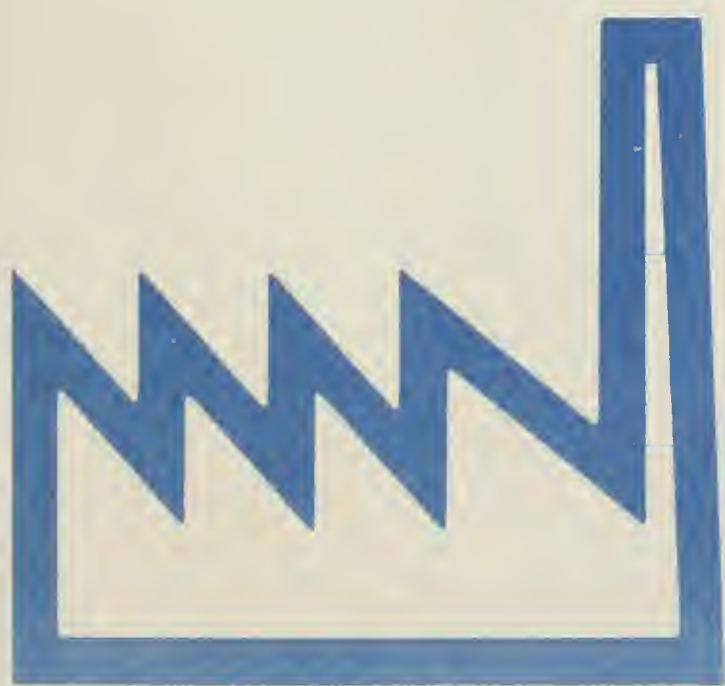
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The publications  
from the 1982 Economic and  
Agriculture Censuses are dedicated  
to the memory of Shirley Kallek,  
Associate Director for Economic Fields.  
During her career at the Bureau of the  
Census (1955 to 1983), she continually  
directed efforts to improve  
the timeliness and accuracy of  
economic statistics.

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# 1982

## Census of Manufactures

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MC82-I-35A

INDUSTRY SERIES

### Engines and Turbines and Farm Machinery and Equipment

3511 Turbines and Turbine Generator Sets  
3519 Internal Combustion Engines, N.E.C.  
3523 Farm Machinery and Equipment  
3524 Lawn and Garden Equipment

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Issued January 1985



**U.S. Department of Commerce**  
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**Clarence J. Brown**, Deputy Secretary  
**Sidney Jones**, Under Secretary for  
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**Economic Fields**

**John H. Berry, Assistant Director for**  
**Economic and Agriculture Censuses**

**INDUSTRY DIVISION**  
**Gaylord E. Worden, Chief**

**ACKNOWLEDGMENTS**—Many persons participated in the various activities of the 1982 Census of Manufactures. Primary direction of the program was performed by Shirley Kellek, Associate Director for Economic Fields (until May 1983), Charles A. Walte, her successor, and Michael G. Farrell, Assistant Director for Economic and Agriculture Censuses (until August 1984), and John H. Berry, his successor.

This report was prepared in the Industry Division under the general direction of Roger H. Bugenhagen, Chief (until April 1983), and Gaylord E. Worden, his successor. John P. Govoni, Assistant Chief for Census/Annual Survey of Manufactures (ASM) Programs, was responsible for the overall management of the census of manufactures. He guided the planning and implementation of the project and coordinated activities with other divisions.

Program responsibility was shared by the following individuals who participated importantly in the entire program: John P. McNamee, Chief, Minerals Branch; Dale W. Gordon, Chief, Census/ASM Durable Branch; Michael J. Zampogna, Chief, Census/ASM Nondurables Branch; Bernard J. Fitzpatrick, Chief, Census Special Reports Branch (until April 1983); and Bruce M. Goldhrach, his successor; Kenneth I. Hansen, Chief, Annual Survey of Manufactures Branch; Malcolm E. Bernhardt, Chief, Current Durables Branch; and Carole A. Ambler, Chief, Current Nondurables Branch.

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Mailout preparation and receipt operations, clerical and analytical review activities, data keying, and geocoding review were performed in the Data Preparation Division, Don L. Adams, Chief.

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# INTRODUCTION

## ECONOMIC CENSUSES OVER TIME

The early beginnings of America's industrial output were first measured in the United States in the 1810 Decennial Census and again in 1820, when questions on manufacturing were included with those for population. Beginning with the 1840 Decennial Census, there were enumerations of manufactures and mineral industries at 10-year intervals up to and including the year 1900 for manufactures and 1940 for mineral industries. The latter census was again taken for 1954, 1958, 1963, and 1967.

Because of the increasing dominance of manufacturing in the early 20th century, Congress directed that quinquennial censuses of manufactures be taken beginning in 1905. However, from 1919 through 1939, these censuses were conducted every 2 years. The need for war-related current surveys in the early 1940's postponed the next census of manufactures until 1948 (for 1947). That census was again taken for 1954, 1958, 1963, and 1967.

Retail and wholesale trade data were first collected in 1930, and in 1933 information on selected service industries was added to the data-collection operation. These business censuses, as they were called, were again taken for 1935, 1939 (as part of the 1940 decennial program), 1948, 1954, 1958, 1963, and 1967.

Information on construction industries was obtained first in 1930 and again for 1935 and 1939. Data for the full spectrum of construction industries were not gathered again until 1968 (for 1967).

The need for transportation data to supplement information available from existing governmental or private sources was recognized by Congress in the late 1950's and early 1960's. The census of transportation (consisting of several surveys) was taken first for 1963 and again for 1967.

Since 1967, all of the above censuses have been taken quinquennially as part of the Census Bureau's economic census program. (For the 1977 censuses, the coverage of the service industries was broadened from "selected services" to "all services, except religious organizations and private households." A total of 41 additional four-digit standard industrial classifications<sup>1</sup> (SIC's) in 7 SIC major groups was added to the scope of the census. While most of the industries included for the first time for 1977 were covered again for 1982, some were not, i.e., hospitals; elementary and secondary schools; colleges, universities, and professional schools; junior colleges and technical institutes; labor unions and similar labor organizations; and political organizations.)

The first manufacturing census for an outlying area was conducted in Puerto Rico for the year 1909. Thereafter, with the exception of 1929, a census was taken at 10-year intervals through 1949. The first censuses of retail trade, wholesale trade, and selected service industries in Puerto Rico were conducted for 1939. These censuses also were taken for the years 1949, 1954, 1958, 1963, and 1967. A census of construction industries was introduced first in Puerto Rico for 1967. These censuses of Puerto Rico have been taken since then for the years 1972, 1977, and 1982.

Censuses of manufactures, retail trade, wholesale trade, and selected service industries were conducted in Guam and the

Virgin Islands of the United States for 1958, 1963, 1967, 1972, 1977, and 1982. Censuses of mineral industries were taken in the Virgin Islands of the United States for the years 1958, 1963, and 1967 but not since that time. A census of construction industries was also undertaken in these areas for 1972, 1977, and 1982.

Retail trade, wholesale trade, selected service industries, manufacturing, and construction industries were canvassed for the first time in the Northern Mariana Islands in 1983 (for 1982).

For 1982, the economic censuses and agriculture censuses were conducted concurrently.

## USES OF THE ECONOMIC CENSUSES

The economic censuses are the major source for facts about the structure and functioning of the Nation's economy and provide essential information for government, business, industry, and the general public. They provide an important part of the framework for such composite measures as the gross national product, input-output measures, indexes of industrial production, and indexes measuring productivity and price levels. Information from the censuses is used to establish sampling frames and as benchmarks for current surveys of business activity, which are essential for measuring short-term economic conditions.

State and local governments use census data to assess business activities within their jurisdictions. The private sector uses the data to forecast general economic conditions; analyze sales performance; lay out sales territories; allocate funds for advertising; decide on locations for new plants, warehouses, or stores; and measure potential markets in terms of size, geographic areas, kinds of business, and kinds of products made or sold.

Following every census, thousands of businesses and other users purchase reports. Likewise, census facts are disseminated widely by trade associations, business journals, and newspapers. Volumes containing census statistics are available in most major public and college libraries. All 1982 data are available on microfiche from the U.S. Government Printing Office and most data on computer tape from the Census Bureau. Finally, the more than 50 State Data Centers also are suppliers of economic census statistics.

## AUTHORITY AND SCOPE OF THE ECONOMIC CENSUSES

The economic censuses are required by law under title 13 of the United States Code, sections 131, 191, and 224, which directs that they be taken at 5-year intervals for the years ending in 2 and 7. The 1982 Economic Censuses covered manufacturing, mining, construction industries, retail trade, wholesale trade, service industries, and selected transportation activities. Special programs also cover minority-owned and women-owned businesses. The next economic censuses are scheduled to be taken in 1988 for the year 1987.

<sup>1</sup>Standard Industrial Classification Manual: 1972. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 041-001-00066-6. 1977 Supplement. Stock No. 003-00500176-0.



# CENSUS OF MANUFACTURES

## General

The 1982 Census of Manufactures is the 31st census of manufactures of the United States. For 1982, it was conducted jointly with the censuses of mineral industries, construction industries, retail and wholesale trades, service industries, selected transportation activities, and minority-owned and women-owned businesses.

This report, from the 1982 Census of Manufactures, is one of a series of 82 industry reports, each of which provides statistics for groups of related industries. Additional separate reports will be issued for each State and on special subjects, such as size of establishments, legal form of organization, and fuels and electric energy consumed.

These separate reports will subsequently be issued as portions of the final census volumes. Volume I, Subject Statistics, will show comparative statistics for industries, States, and standard metropolitan statistical areas. It also will show selected subjects, such as concentration ratios in manufacturing, selected materials consumed, manufacturing activity in government establishments, and water use in manufacturing. Volume II, Industry Statistics, will be a consolidation of reports for the 82 groups of industries showing the same information that is shown in this report. Volume III, Geographic Area Statistics, will contain establishment-based data (number of establishments, employment, payroll, value added by manufacture, and capital expenditures) for each State and its important standard metropolitan statistical areas, counties, and places, by industry groups and important individual industries. Totals for "all manufacturing" will be shown for counties and places with more than 450 manufacturing employees. The introduction to the final volumes will discuss, at greater length, many of the subjects described in this introduction. For example, the volume text will discuss the relationship of value added by manufacture to National income by industry of origin, the changes in statistical concepts over the history of the censuses, and the valuation problems arising from intracompany transfers between manufacturing plants of a company and between manufacturing plants and sales offices and sales branches of a company.

## Scope of Census and Definition of Manufacturing Industries

The 1982 Census of Manufactures covers all establishments employing one person or more primarily engaged in manufacturing as defined in the 1972 Standard Industrial Classification (SIC) Manual and its 1977 Supplement.<sup>1</sup> This is the system of industrial classification developed over a period of years by experts on classification in government and private industry under the guidance of the Office of Management and Budget. This system of classification is in general use among government agencies as well as organizations outside the government.

The SIC manual defines manufacturing as the mechanical or chemical transformation of inorganic or organic substances into new products. The assembly of component parts of products is also considered to be manufacturing if the resulting product is neither a structure nor other fixed improvement. These activities are usually carried on in plants, factories, or mills that characteristically use power-driven machines and materials handling equipment.

<sup>1</sup>Standard Industrial Classification Manual: 1972. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 041-001-00066-6. 1977 Supplement. Stock No. 003-00500176-0.

Manufacturing production is usually carried on for the wholesale market, for transfers to other plants of the same company, or to the order of industrial users rather than for direct sale to the household consumer. Some manufacturers in a few industries sell chiefly at retail to household consumers through the mail, through house-to-house routes, or through salespersons. Some activities of a service nature (enameling, engraving, etc.) are included in manufacturing when they are performed primarily for the trade. They are considered nonmanufacturing when they are performed primarily to the order of the household consumer.

## Relationship Between Annual Survey of Manufactures and Census of Manufactures

The Bureau of the Census conducts the annual survey of manufactures (ASM) in each of the 4 years between the censuses of manufactures. The ASM is based on a scientifically selected sample of approximately 55,000 establishments and collects the same industry statistics (employment, payroll, value of shipments, etc.) as the census of manufactures. In addition to collecting the information normally requested on the census form, the establishments in the ASM sample are requested to supply detailed information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, and costs of purchased services.

## Establishment Basis of Reporting

The census of manufactures and the annual survey of manufactures are conducted on an establishment basis. A company operating at more than one location is required to file a separate report for each location. Companies engaged in distinctly different lines of activity at one location are requested to submit separate reports if the plant records permit such a separation and if the activities are substantial in size.

In 1982, as in earlier years, a minimum size limit was set for including establishments in the census. All establishments employing one person or more at any time during the census year are included. The same size limitation has applied since 1947 in censuses and annual surveys of manufactures. In the 1939 and earlier censuses, establishments with less than \$5,000 value of products were excluded. The change in the minimum size limit in 1947 does not appreciably affect the historical comparability of the census figures except for data on number of establishments for a few industries.

This report excludes information for separately operated administrative offices, warehouses, garages, and other auxiliary units that service manufacturing establishments of the same company (see Auxiliaries).

## Manufacturing Universe and Census Report Forms

The 1982 Census of Manufactures universe includes approximately 345,000 establishments. The amounts of information requested from manufacturing establishments were dependent upon a number of factors. The more important considerations were the size of the company and whether it was included in the annual survey of manufactures. The methods of obtaining information for the various subsets of the universe to arrive at the aggregate figures shown in this publication are described below.

### 1. Small Single-Unit Companies Not Sent a Report Form

In the 1982 Census of Manufactures, approximately 140,000 small single-establishment companies were excluded from filing reports. Selection of these small



establishments was done on an industry-by-industry basis and was based on annual payroll and total shipments data as well as on the industry classification codes contained in the administrative records of other Federal agencies. The cutoffs were selected so that these administrative records cases would account for no more than 3 percent of the value of shipments for the industry. Generally, all single-establishment companies with less than 5 employees were excused, while all establishments with more than 20 employees were mailed report forms.

Information on the physical location of the establishment, as well as information on payrolls, receipts (shipments), and industry classification, was obtained from the administrative records of other Federal agencies under special arrangements, which safeguarded their confidentiality. Estimates of data for these small establishments were developed using industry averages in conjunction with the administrative information. The value of shipments and cost of materials were not distributed among specific products and materials for these establishments but were included in the product and material "not specified by kind" (n.s.k.) categories.

The industry classification codes included in the administrative records files were assigned on the basis of brief descriptions of the general activity of the establishment. As a result, an indeterminate number of establishments were erroneously coded to the four-digit SIC level. This was especially true whenever there was a relatively fine line of demarcation between industries or between manufacturing and nonmanufacturing activity.

Sometimes these administrative record cases were given only a two- or three-digit SIC group. For the 1982 Census of Manufactures, these establishments were sent a separate classification form, which requested information on the products and services of the establishment. This form was used to code many of these establishments to the four-digit SIC level. Establishments that did not return the classification form were coded later to those four-digit SIC industries identified as "not elsewhere classified" (n.e.c.) within the given two- or three-digit industry groups.

As a result of these situations, a number of small establishments may have been misclassified by industry. However, such possible misclassifications have no significant effect on the statistics other than on the number of establishments.

The total establishment count for individual industries should be viewed as an approximation rather than a precise measurement. The counts for establishments with 20 employees or more are far more reliable than the count of total number of establishments.

## **2. Establishments Sent a Report Form**

The 205,000 establishments covered in the mail canvass were divided into three groups:

**a. ASM sample establishments**—This group consisted of approximately 55,000 establishments covering all the units of large manufacturing establishments as well as a sample of the medium and smaller establishments. The probability of selection was proportionate to size (see appendix, Annual Survey of Manufactures).

In a census of manufactures year, the ASM report form (MA-1000) replaces the first page of the regular census form for those establishments included in the ASM. In addition to information on employment, payroll,

and other items normally requested on the regular census form, establishments in the ASM sample were requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, and costs of purchased services. Results of the ASM inquiries are included in tables 3c and 3d of this report.

The census part of the report form is one of approximately 200 versions containing product, material, and special inquiries. The diversity of manufacturing activities necessitated the use of this many forms to canvass the approximately 450 manufacturing industries. Each form was developed for a group of related industries.

Appearing on each form was a list of products primary to the group of related industries, as well as secondary products and miscellaneous services that establishments classified in these industries were likely to be performing. Respondents were requested to identify the products, the value of each product, and, in a large number of cases, the quantity of the product shipped during the survey year. Space was also provided for the respondent to describe products not specifically identified on the form.

The report form also contained a materials-consumed inquiry, which varied from form to form depending on the industries being canvassed. The respondents were asked to review a list of materials generally used in their production processes. From this list, each establishment was requested to identify those materials consumed during the survey year, the cost of each, and, in certain cases, the quantity consumed. Once again, space was provided for the respondent to describe significant materials not identified on the form.

Finally, a wide variety of special inquiries was included to measure activities peculiar to a given industry, such as operations performed and equipment used.

**b. Large and medium establishments (non-ASM)**—Approximately 100,000 establishments were included in this group. A variable cutoff, based on administrative records payroll data and determined on an industry-by-industry basis, was used to select those establishments that were to receive one of the approximately 200 census of manufactures regular forms. The first page, requesting establishment data for items such as employment and payroll, was standard but did not contain the detailed statistics included on the ASM form. The product, material, and special inquiry sections supplied were based on the historical industry classification of the establishment.

**c. Small single-unit establishments (non-ASM)**—This group consisted of approximately 50,000 establishments. For those industries where application of the variable cutoff for administrative records cases resulted in a large number of small establishments being included in the mail canvass, an abbreviated or "short" form was used. These establishments received one of the approximately 80 versions of the short form, which requested summary product and material data and totals but no details on employment, payrolls, cost of materials, inventories, and capital expenditures.

Use of the short form has no adverse effect on published totals for the industry statistics; the same



data were collected on the short as well as the long form. However, detailed information on materials consumed was not collected on the short form; thus its use would increase the values of the n.s.k. categories.

## Auxiliaries

In this industry report, the data on employment and payroll are limited to operating manufacturing establishments. The census report form filed for auxiliaries (ES-9200) requested a description of the activity of the establishments serviced. However, the auxiliaries were coded only to the two-digit major group of the establishments they served; whereas, the operating establishments were coded to a four-digit manufacturing industry. Data for the approximately 10,000 separately operated auxiliaries are included in the paperbound geographic area series, the bound volumes of the census of manufactures, and in a report issued as part of the 1982 Enterprise Statistics survey.

Auxiliaries are establishments whose employees are primarily engaged in performing supporting services for other establishments of the same company, rather than for the general public or for other business firms. They can be at different locations from the establishments served or at the same location as one of those establishments but not operating as an integral part thereof and serving two or more establishments. Where auxiliary operations are conducted at the same location as the manufacturing operation and operate as an integral part thereof, they usually are included in the report for the operating manufacturing establishment.

Included in the broad category of auxiliaries are administrative offices. Employees in administrative offices are concerned with the general management of multiestablishment companies, i.e., with the general supervision and control of two units or more, such as manufacturing plants, mines, sales branches, or stores. The functions of these employees may include (1) program planning, including sales research and coordination of purchasing, production, and distribution; (2) company purchasing, including general contracts and purchasing methods; (3) company financial policy and accounting, tax accounting, company sales and profit reports, and personnel accounting; (4) general engineering, including design of product machinery and equipment, and direction of engineering effort conducted at the individual operation locations; (5) direction of company personnel matters; and (6) legal and patent matters.

Other types of auxiliaries serving the plants or central management of the company include purchasing offices, sales promotion offices, research and development organizations, etc.

## Industry Classification of Establishments

Each of the establishments covered in the census was classified in one of approximately 450 manufacturing industries in accordance with the industry definitions in the SIC system. Under this system of classification, an industry is generally defined as a group of establishments producing a single product or a closely related group of products. The product groupings from which industry classifications are derived are based on considerations such as similarity of manufacturing processes, types of materials used, types of customers, and the like. The resulting group of plants must be significant in terms of its number, value added by manufacture, value of shipments, and number of employees. The system operates in such a way that the definitions progressively became narrower with successive additions of numerical digits. There are 20 major groups (two-digit SIC), 143 industry groups (three-digit SIC), and approximately 450

industries (four-digit SIC). The product classes and products of the manufacturing industries have been assigned codes based on the industry from which they originate. There are about 1,500 classes of products, identified by a five-digit code, and about 11,000 products, identified by a seven-digit code. The seven-digit products are considered the primary products of the industry with the same four digits.

Accordingly, an establishment is usually classified in a particular industry on the basis of its major activity during a particular year, i.e., production of the products primary to that industry exceeds, in value, production of the products primary to any other single industry. In a few instances, however, the industry classification of an establishment is not only determined by the products it makes but also by the process employed in making those products. For example, establishments engaged in blast furnace operations, refining of nonferrous metals from ore, or rolling and drawing of nonferrous metals (processes which involve heavy capitalization in specialized equipment) would be classified according to the process used during a census year. These establishments then would be "frozen" in that industry during the following ASM years.

In either a census or ASM year, establishments included in the ASM sample with certainty weight, other than those involved with heavily capitalized activities described above, are reclassified by industry only if the change in the primary activity from the prior year is significant or the change has occurred for two successive years. This procedure prevents reclassification when there are minor shifts in product mix.

In ASM years, establishments included in the ASM sample with noncertainty weight are not shifted from one industry classification to another. They are retained in the industry where they were classified in the base census year (see appendix, Annual Survey of Manufactures). However, in the following census year, these ASM plants are allowed to shift from one industry to another.

The result of these rules covering the switching of plants from one industry classification to another is that, at the aggregate level, some industries comprise different mixes of establishments between survey years, and establishment data for such industry statistics as employment and payroll may be tabulated in different industries between survey years. Hence, comparisons between prior-year and current-year published totals, particularly at the four-digit SIC level, should be viewed with caution. This is true particularly for the comparison between the data shown for a census year versus the data shown for the previous ASM year.

As previously noted, the small establishments that may have been misclassified by industry are usually administrative-record cases whose industry codes were assigned on the basis of incomplete descriptions of the general activity of the establishment. Such possible misclassifications have no significant effect on the statistics other than on the number of establishments.

While some establishments produce only the primary products of the industry in which they are classified, all establishments of an industry rarely specialize to this extent. The industry statistics (employment, inventories, value added by manufacture, total value of shipments including resales and miscellaneous receipts, etc.) shown in tables 1a through 5a, therefore, reflect not only the primary activities of the establishments in that industry but also their secondary activities. The product statistics in tables 6a through 6c represent the output of all establishments whether or not they are classified in the same industry as the product. For this reason, in relating the industry statistics, especially the value of shipments to the product statistics, the



composition of the industry's output shown in table 5b should be considered.

The extent to which industry and product statistics may be matched with each other is measured by two ratios, which are computed from the figures shown in table 5b. The first of these ratios, called the primary product specialization ratio, measures the proportion of product shipments (both primary and secondary) of the establishments classified in the industry represented by the primary products of those establishments. The second ratio, called the coverage ratio, is the proportion of primary products shipped by the establishments classified in the industry to total shipments of such products by all manufacturing establishments.

However, establishments making products falling into the same industry category may use a variety of processes and materials to produce them. Also, the same industry classification (based on end products) may include both establishments that are highly integrated and those that put only the finishing touches on an already highly fabricated item. For example, the refrigeration industry includes instances of almost complete integration (production of the compressor, condensing unit, electric motor, casting, stamping of the case, and final assembly) all carried on at one plant. On the other hand, the condensing unit, the motor, and the case may be purchased and only assembled into the finished product.

In some instances, separate industry categories have been established for integrated and nonintegrated establishments. For other industries, the census provides separate statistics on the production of intermediate commodities made and used in the producing plant. For some industries characterized by many plants of the same company, separate figures on interplant transfer of products usually are shown.

Differences in the integration of production processes, types of operations, and alternatives in types of materials used should be considered when relating the industry statistics (employment, payrolls, value added, etc.) to the product and material data.

### Value of Shipments for the Industry Compared With Value of Product Shipments

This industry report shows value of shipments data for industries and products. In tables 1a through 5a, these data represent the total value of shipments of all establishments classified in a particular industry. The data include the shipments of the products classified in the industry (primary to the industry), products classified in other industries (secondary to the industry), and miscellaneous receipts (repair work, sale of scrap, research and development, installation receipts, and resales). Product shipments shown in table 6a represent the total value of shipments of products classified as primary to an industry that were shipped by all manufacturing establishments regardless of their industry classification.

### CENSUS DISCLOSURE RULES

In accordance with Federal law governing census reports, no data are published that would disclose the data for an individual establishment or company. However, the number of establishments classified in a specific industry is not considered a disclosure, so this item may be given even though other information is withheld.

The disclosure analysis for the industry statistics in tables 1a through 5a of this report is based on the total value of shipments. When the total value of shipments cannot be shown without disclosing information for individual companies, the complete line has been suppressed. However, the suppressed data are included in higher level totals. Additional disclosure analysis is performed for new capital expenditures that can be suppressed even though value of shipments data are publishable.

### MICROFICHE AND COMPUTER TAPES

All the data in this report are available on microfiche. Selected data are also available on computer tape.

In addition to selected published data being on computer tape, one major data series, the location of manufacturing plants, will be available only on computer tape. This series presents the number of establishments by employment size class by four-digit SIC industry codes for States, counties, and places of 2,500 inhabitants or more. These data are available for both State and county by industry, and State and place by industry.

Microfiche reports are sold by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Computer tapes are sold by the Data User Services Division, Customer Services (Tapes), Bureau of the Census, Washington, D.C. 20233.

### SPECIAL TABULATIONS

Special tabulations of data collected in the 1982 Census of Manufactures may be obtained on computer tape or in tabular form. The data will be in summary form and subject to the same rules prohibiting disclosure of confidential information (including name, address, kind of business, or other data for individual business establishments or companies) as are the regular publications.

Special tabulations are prepared on a cost basis. A request for a cost estimate, as well as exact specifications on the type and format of the data to be provided, should be directed to the Chief, Industry Division, Bureau of the Census, Washington, D.C. 20233.

### ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used in this publication:

- Represents zero.
- (D) Withheld to avoid disclosing data for individual companies; data are included in higher level totals.
- (NA) Not available.
- (NC) Not comparable.
- (S) Withheld because estimate did not meet publication standards on the basis of either the response rate or a consistency review.
- (X) Not applicable.
- (Z) Less than half the unit shown.
- n.e.c. Not elsewhere classified.
- n.s.k. Not specified by kind.
- pt. Part.
- r Revised.
- SIC Standard Industrial Classification.

Other abbreviations, such as lb, gal, yd, doz, bbl, and s tons, are used in the customary sense.



# Users' Guide for Locating Statistics

[For explanation of terms, see appendixes]

	Item	Four-digit industry statistics		
		Historical	Operating ratios	By geographic area
1	Number of companies . . . . .	1a		
2	Number of manufacturing establishments . . . . .	1a		2
	Employment and payroll:			
3	Number of employees . . . . .	1a	1b	2
4	Payroll . . . . .	1a	1b	2
5	Supplemental labor costs . . . . .			
6	Production workers . . . . .	1a	1b	2
7	Production-worker hours . . . . .	1a	1b	2
8	Production-worker wages . . . . .	1a	1b	2
	Shipments, cost of materials, and value added:			
9	Value of shipments (four-digit) . . . . .	1a	1b	2
10	Product class shipments (five-digit) . . . . .			
11	Product shipments (seven-digit) . . . . .			
12	Value added by manufacture . . . . .	1a	1b	2
13	Cost of materials . . . . .	1a	1b	2
14	Fuels and electric energy . . . . .			
15	Materials consumed by kind . . . . .			
	Inventories:			
16	Total, end of year . . . . .	1a		
17	By method of valuation . . . . .			
18	By stage of fabrication . . . . .			
	Capital expenditures, assets, rental payments, and purchased services:			
19	New capital expenditures . . . . .	1a		2
20	Used plant and equipment expenditures . . . . .			
21	Gross assets . . . . .			
22	Depreciation . . . . .			
23	Retirements of buildings and machinery . . . . .			
24	Rental payments . . . . .			
25	Purchased services . . . . .			
	Ratios:			
26	Specialization . . . . .	1a		
27	Coverage . . . . .	1a		

\*Number of companies with shipments of over \$100 thousand.

\*\*Detailed information shown.

# In This Report by Table Number

Four-digit industry statistics—Con.				Five-digit product class and seven-digit product statistics				
Summary and supplemental	By employment size	By industry and product class specialization	Materials consumed by kind	Industry-product analysis	Product shipments	Product class by geographic area	Historical product class	
3a					*6a			1
**3a	4	5a						2
3a	4	5a						3
3a	4	5a						4
**3d								5
**3a	4	5a						6
**3a	4	5a						7
3a	4	5a						8
3a	4	5a		5b, 5c				9
				5b, 5c	6a	6b	6c	10
					6a			11
3a	4	5a						12
**3a	4	5a						13
3a, 3d			7					14
								15
3b, 3c	4							16
3b, 3c								17
3b								18
**3a, **3d	4	5a						19
**3a, **3d								20
**3d								21
**3d								22
**3d								23
**3d								24
**3d								25
3a				5b				26
3a				5b				27





# Engines and Turbines and Farm Machinery and Equipment

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# DESCRIPTION OF INDUSTRIES AND SUMMARY OF FINDINGS

## ENGINES AND TURBINES AND FARM MACHINERY AND EQUIPMENT

This report shows 1982 Census of Manufactures statistics for establishments classified in each of the following industries:

### SIC Code and Title

- 3511 Turbines and Turbine Generator Sets
- 3519 Internal Combustion Engines, N.E.C.
- 3523 Farm Machinery and Equipment
- 3524 Lawn and Garden Equipment

The industry statistics (employment, payroll, cost of materials, value of shipments, inventories, etc.) are reported for each establishment as a whole. Aggregates of such data for an industry reflect not only the primary activities of the establishments but also their activities in the manufacture of secondary products as well as their miscellaneous activities (contract work on materials owned by others, repair work, etc.). This fact should be taken into account in comparing industry statistics (tables 1a-5a) with product statistics (table 6a) showing shipments by all industries of the primary products of the specified industry. The extent of the "product mix" is indicated in table 5b, which shows the value of primary and secondary products shipped by establishments classified in the specified industry and the value of primary products of the industry shipped as secondary products by establishments classified in other industries.

Small single-unit companies with up to 20 employees (cutoff varied by industry) were excluded from the mail portion of the census. For these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated), data on payrolls and receipts were obtained from administrative records of other government agencies. The remaining statistics were developed from industry averages.

Establishment data were tabulated based on industry definitions contained in the 1972 Standard Industrial Classification (SIC) Manual and its 1977 supplement.<sup>1</sup>

## INDUSTRY 3511, TURBINES AND TURBINE GENERATOR SETS

This industry comprises establishments primarily engaged in the manufacture of steam turbines; hydraulic turbines; gas turbines, except aircraft; and complete steam, gas, and hydraulic turbine generator set units. Establishments primarily engaged in building or rebuilding locomotives are classified in industry 3743, and those manufacturing nonautomotive type generators

which are not part of a turbine generator set are classified in industry 3621.

In the 1982 Census of Manufactures, Industry 3511, Turbines and Turbine Generator Sets, recorded employment of 32.4 thousand. The total value of shipments for establishments classified in this industry was \$3,676 million.

The value of shipments figure shown above is in current (1982) prices. All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

The employment figure shown above was 21 percent below the 40.9 thousand reported in 1977. The leading States in employment in 1982 were New York, Pennsylvania, Massachusetts, and California, accounting for approximately 75 percent of the industry's 1982 employment. Data for these States have been withheld to avoid disclosing data for individual companies. These same States were the leaders in 1977, when they accounted for approximately 77 percent of the industry's employment.

Compared with 1981, employment decreased 11 percent. The 1981 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. In current prices, industry 3511 shipped \$2,948 million of products primary to the industry, \$186 million of secondary products, and had \$542 million of miscellaneous receipts. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 94 percent (specialization ratio). In 1977, this specialization ratio was 92 percent.

Establishments in this industry also accounted for 80 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1977, the coverage ratio was 82 percent. The products primary to industry 3511, no matter in what industry they were produced, appear in table 6a and aggregate to \$3,662 million in current prices.

The total cost of materials and services used by establishments classified in the turbines and turbine generator sets industry amounted to \$1,515 million in current prices. Data on specific materials consumed appear in table 7.

Establishments of single-unit companies in this industry with up to 5 employees were excluded from the mail portion of the census. There were no establishments for which administrative records were used. A small number of larger establishments whose reports were not received at the time the data were tabulated were obtained from administrative records and other agencies or developed from industry averages. These

<sup>1</sup>Standard Industrial Classification Manual: 1972. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 041-001-00066-8. 1977 Supplement. Stock No. 003-005-00176-0.



establishments accounted for less than 1 percent of total value of shipments.

## **INDUSTRY 3519, INTERNAL COMBUSTION ENGINES, N.E.C.**

This industry comprises establishments primarily engaged in the manufacture of diesel, semi-diesel, or other internal combustion engines, not elsewhere classified, for stationary, marine, traction, and other uses. Establishments primarily engaged in the manufacture of aircraft engines are classified in industry 3724; automotive engines, except diesel, in industry 3714; engine generator sets in industry 3621; and guided missile and space vehicle propulsion units in industry 3764.

In the 1982 Census of Manufactures, Industry 3519, Internal Combustion Engines, N.E.C., recorded employment of 79.5 thousand. The total value of shipments for establishments classified in this industry was \$9,356 million.

The value of shipments figure shown above is in current (1982) prices. All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

The employment figure shown above was 10 percent below the 88.8 thousand reported in 1977. The leading States in employment in 1982 were Wisconsin, Illinois, Indiana, and Michigan, accounting for approximately 64 percent of the industry's 1982 employment. Data for Wisconsin, Illinois, and Indiana have been withheld to avoid disclosing data for individual companies. These same States were the leaders in 1977, when they accounted for approximately 72 percent of the industry's employment.

Compared with 1981, employment decreased 11 percent. The 1981 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. In current prices, industry 3519 shipped \$7,818 million of products primary to the industry, \$965 million of secondary products, and had \$572 million of miscellaneous receipts. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 89 percent (specialization ratio). In 1977, this specialization ratio was 91 percent.

Establishments in this industry also accounted for 87 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1977, the coverage ratio was 88 percent. The products primary to industry 3519, no matter in what industry they were produced, appear in table 6a and aggregate to \$8,972 million in current prices.

The total cost of materials and services used by establishments classified in the internal combustion engines, n.e.c., industry amounted to \$5,129 million in current prices. Data on specific materials consumed appear in table 7.

Single-unit establishments in this industry with less than 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger

establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 1 percent of total value of shipments.

## **INDUSTRY 3523, FARM MACHINERY AND EQUIPMENT**

This industry comprises establishments primarily engaged in the manufacture of farm machinery and equipment, including wheel tractors, for use in the preparation and maintenance of the soil; planting and harvesting of the crop; preparation of crops for market on the farm; or for use in performing other farm operations and processes; and in the manufacture of commercial turf and grounds care equipment. Establishments primarily engaged in the manufacture of industrial trucks, tractors, and trailers used for handling materials in industrial plants, depots, and docks are classified in industry 3537; contractors' off-highway tractors in industry 3531; farm hand tools in group 342; and garden tractors, lawn mowers, and other lawn and garden equipment in industry 3524.

In the 1982 Census of Manufactures, Industry 3523, Farm Machinery and Equipment, recorded employment of 96.0 thousand. The total value of shipments for establishments classified in this industry was \$10,742 million.

The value of shipments figure shown above is in current (1982) prices. All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

The employment figure shown above was 27 percent below the 131.3 thousand reported in 1977. The leading States in employment in 1982 were Iowa, Illinois, Wisconsin, and Nebraska, accounting for approximately 53 percent of the industry's 1982 employment. Data for Iowa and Nebraska have been withheld to avoid disclosing data for individual companies. This represents a shift from 1977 when Iowa, Illinois, Nebraska, and Kansas accounted for approximately 47 percent of the industry's employment.

Compared with 1981, employment decreased 23 percent. The 1981 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. In current prices, industry 3523 shipped \$9,835 million of products primary to the industry, \$597 million of secondary products, and had \$310 million of miscellaneous receipts. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 94 percent (specialization ratio). In 1977, this specialization ratio was 92 percent.

Establishments in this industry also accounted for 95 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1977, the coverage ratio also was 95 percent. The products primary to industry 3523, no matter in what industry they were produced,



appear in table 6a and aggregate to \$10,370 million in current prices.

The total cost of materials and services used by establishments classified in the farm machinery and equipment industry amounted to \$5,217 million in current prices. Data on specific materials consumed appear in table 7.

Single-unit establishments in this industry with less than 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 5 percent of total value of shipments.

## **INDUSTRY 3524, LAWN AND GARDEN EQUIPMENT**

This industry comprises establishments primarily engaged in the manufacture of lawn mowers, garden tractors, and other lawn and garden equipment used for home lawn and garden care. Establishments primarily engaged in the manufacture of farm machinery are classified in industry 3523; hand lawn and garden shears and pruners in industry 3421; and other garden hand tools in industry 3423.

In the 1982 Census of Manufactures, Industry 3524, Lawn and Garden Equipment, recorded employment of 17.8 thousand. The total value of shipments for establishments classified in this industry was \$2,365 million.

The value of shipments figure shown above is in current (1982) prices. All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

The employment figure shown above was 9 percent below the 19.5 thousand reported in 1977. The leading States in employment in 1982 were Wisconsin, Illinois, Mississippi, and

Ohio, accounting for approximately 46 percent of the industry's 1982 employment. This represents a shift from 1977 when Wisconsin, Mississippi, North Carolina, and Illinois accounted for approximately 49 percent of the industry's employment.

Compared with 1981, employment decreased 2 percent. The 1981 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. In current prices, industry 3524 shipped \$2,097 million of products primary to the industry, \$197 million of secondary products, and had \$71 million of miscellaneous receipts. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 91 percent (specialization ratio). In 1977, this specialization ratio was 92 percent.

Establishments in this industry also accounted for 88 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1977, the coverage ratio was 82 percent. The products primary to industry 3524, no matter in what industry they were produced, appear in table 6a and aggregate to \$2,385 million in current prices.

The total cost of materials and services used by establishments classified in the lawn and garden equipment industry amounted to \$1,376 million in current prices. Data on specific materials consumed appear in table 7.

Single-unit establishments in this industry with less than 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 5 percent of total value of shipments.



Table 1a. Historical Statistics for the Industry: 1982 and Earlier Years

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year <sup>1</sup>	Companies <sup>2</sup> (no.)	All establishments <sup>3</sup>		All employees		Production workers			Value added by manufac- ture <sup>4</sup> (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expendi- tures (million dollars)	End-of- year inven- tories <sup>4</sup> (million dollars)	Ratios	
		Total (no.)	With 20 employ- ees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						Speci- alization (per- cent)	Cover- age (per- cent)
INDUSTRY 3511, TURBINES AND TURBINE GENERATOR SETS															
1982 Census	71	88	49	32.4	870.8	18.9	37.4	431.6	2 152.9	1 515.0	3 676.3	127.9	1 501.3	94	80
1981 ASM	(NA)	(NA)	(NA)	36.5	894.8	21.6	44.2	429.4	2 123.3	1 625.3	3 735.2	78.5	1 007.0	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	36.1	820.1	21.8	44.2	409.8	2 002.5	1 497.6	3 483.6	121.8	841.3	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	37.2	782.3	22.1	44.8	379.7	1 771.8	1 288.3	3 087.9	91.6	821.2	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	39.5	730.7	24.0	48.4	378.3	1 478.8	1 218.0	2 733.0	59.9	886.6	(NA)	(NA)
1977 Census	69	84	38	40.9	710.1	24.8	51.2	369.0	1 558.4	1 245.0	2 733.7	45.8	828.7	92	82
1978 ASM	(NA)	(NA)	(NA)	44.8	705.7	27.0	55.2	367.1	1 560.1	1 384.9	2 905.0	70.4	798.3	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	43.7	609.9	26.8	54.8	324.2	1 264.9	1 262.8	2 527.7	86.8	730.2	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	50.0	631.0	31.0	61.8	344.4	1 414.8	1 215.1	2 520.0	78.9	750.1	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	47.9	592.8	29.1	59.1	314.7	1 334.3	1 043.6	2 322.1	100.9	609.0	(NA)	(NA)
1972 Census	59	75	46	48.2	548.9	28.8	59.2	299.1	1 225.3	968.6	2 189.0	93.5	528.3	92	90
1971 ASM	(NA)	(NA)	(NA)	48.9	540.8	31.4	63.1	315.8	1 089.8	1 112.7	2 202.2	109.7	594.1	(NA)	(NA)
1970 ASM	(NA)	(NA)	(NA)	47.8	488.4	29.6	80.9	282.3	961.3	966.3	1 804.7	93.6	617.0	(NA)	(NA)
1969 ASM	(NA)	(NA)	(NA)	42.9	414.8	27.3	57.5	249.0	707.7	717.4	1 501.5	124.0	443.6	(NA)	(NA)
1968 ASM	(NA)	(NA)	(NA)	37.6	344.8	24.5	50.1	202.0	609.8	608.3	1 200.8	113.9	379.5	(NA)	(NA)
1967 Census	20	27	23	36.2	318.8	24.8	49.9	195.8	582.3	475.5	1 043.2	66.3	314.2	83	78
INDUSTRY 3519, INTERNAL COMBUSTION ENGINES, N.E.C.															
1982 Census	200	252	158	79.5	1 976.3	52.4	95.2	1 220.7	3 911.1	5 129.3	9 355.6	599.5	1 775.1	89	87
1981 ASM	(NA)	(NA)	(NA)	89.1	2 191.8	63.2	126.0	1 471.2	5 247.4	8 322.4	11 545.6	637.1	1 728.3	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	89.4	1 964.8	63.4	125.1	1 321.2	4 564.7	5 550.8	10 194.2	323.1	1 715.8	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	101.1	2 010.8	74.2	143.8	1 372.7	4 521.9	5 790.2	10 096.5	401.2	1 736.4	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	95.9	1 778.3	70.0	140.2	1 218.6	4 010.6	5 784.3	9 618.0	317.0	1 558.6	(NA)	(NA)
1977 Census	186	232	131	88.8	1 528.6	65.3	130.1	1 038.2	3 406.5	4 459.7	7 696.5	285.8	1 342.0	91	88
1978 ASM	(NA)	(NA)	(NA)	79.8	1 232.9	58.2	114.0	819.9	2 640.2	3 549.7	6 104.1	227.2	1 083.9	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	77.5	1 066.6	55.9	106.9	705.4	2 189.4	2 918.3	5 093.3	252.1	969.3	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	80.8	1 079.0	60.6	124.8	750.9	2 251.4	2 850.1	4 918.7	278.3	977.7	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	75.8	919.1	57.0	116.8	642.9	1 933.0	2 125.3	3 989.8	197.4	732.1	(NA)	(NA)
1972 Census	145	179	109	69.9	771.4	52.2	104.3	534.5	1 674.2	1 747.1	3 318.4	92.0	639.5	91	85
1971 ASM	(NA)	(NA)	(NA)	65.9	660.8	48.8	93.6	441.4	1 440.7	1 388.3	2 822.7	78.0	555.7	(NA)	(NA)
1970 ASM	(NA)	(NA)	(NA)	69.3	659.6	51.2	100.4	439.8	1 326.6	1 351.2	2 676.0	134.5	563.6	(NA)	(NA)
1969 ASM	(NA)	(NA)	(NA)	75.5	686.2	58.2	114.4	468.3	1 375.5	1 478.2	2 804.0	81.9	539.4	(NA)	(NA)
1968 ASM	(NA)	(NA)	(NA)	66.1	545.2	49.5	100.0	373.1	1 111.0	1 212.0	2 279.0	88.7	450.6	(NA)	(NA)
1967 Census	129	155	96	63.7	500.8	47.5	97.2	344.6	1 015.8	1 091.5	2 093.2	97.6	414.1	89	83
INDUSTRY 3523, FARM MACHINERY AND EQUIPMENT															
1982 Census	1 786	1 903	620	96.0	2 067.1	62.9	113.6	1 205.5	5 200.0	5 217.2	10 741.8	341.1	2 231.9	94	95
1981 ASM	(NA)	(NA)	(NA)	125.0	2 631.3	87.8	161.3	1 669.9	6 268.1	7 512.9	13 948.9	522.5	2 159.9	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	133.4	2 576.9	95.6	178.8	1 674.1	6 057.0	6 721.1	12 845.2	458.9	2 333.5	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	140.3	2 481.6	104.1	201.9	1 662.8	6 023.3	7 244.4	12 998.2	360.6	2 395.1	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	121.0	1 982.1	89.2	170.5	1 325.8	4 796.3	5 333.5	10 053.6	317.9	2 109.3	(NA)	(NA)
1977 Census	1 864	2 004	664	131.3	1 971.9	96.2	182.7	1 313.3	4 854.4	5 469.7	10 281.7	341.8	2 083.4	92	95
1976 ASM	(NA)	(NA)	(NA)	127.3	1 741.8	94.3	179.8	1 178.1	4 248.9	4 913.8	9 133.1	254.3	1 991.6	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	130.0	1 869.2	97.9	193.2	1 161.8	3 898.6	4 691.6	8 530.9	301.3	1 910.8	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	132.8	1 558.2	103.2	206.2	1 119.6	3 567.6	3 846.7	7 078.5	199.6	1 783.3	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	123.1	1 292.2	94.7	184.8	912.6	2 777.6	3 098.3	5 693.7	109.3	1 295.8	(NA)	(NA)
1972 Census <sup>5</sup>	1 465	1 547	563	104.6	1 045.7	79.9	157.1	732.3	2 248.0	2 401.5	4 531.4	118.0	998.7	90	94
INDUSTRY 3524, LAWN AND GARDEN EQUIPMENT															
1982 Census	151	175	84	17.8	318.1	12.4	24.6	198.7	945.5	1 375.7	2 365.2	51.1	539.6	91	88
1981 ASM	(NA)	(NA)	(NA)	18.1	300.2	12.9	24.4	183.4	780.6	1 219.9	2 005.4	35.7	509.4	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	20.3	313.4	14.3	27.0	191.5	930.8	1 310.6	2 247.4	56.8	538.6	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	24.8	346.7	18.8	35.4	231.2	1 072.7	1 518.4	2 536.9	55.0	546.1	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	21.9	274.6	18.6	30.4	179.8	808.4	1 119.3	1 882.9	39.8	431.8	(NA)	(NA)
1977 Census	136	154	91	19.5	222.4	14.6	27.5	141.3	631.7	939.1	1 569.5	28.5	379.3	92	82
1976 ASM	(NA)	(NA)	(NA)	18.7	207.1	13.8	27.3	134.8	534.2	862.2	1 400.6	33.2	359.8	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	19.6	202.8	14.1	27.8	131.8	466.6	832.4	1 352.7	46.1	373.0	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	25.3	232.1	19.1	36.6	156.5	646.4	998.0	1 562.9	40.8	500.7	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	21.7	193.6	16.5	32.2	129.7	468.5	738.6	1 174.1	29.2	305.4	(NA)	(NA)
1972 Census <sup>5</sup>	100	110	86	20.7	165.5	15.1	29.3	108.3	453.2	652.2	1 059.1	47.6	287.2	90	82

<sup>1</sup>In annual survey of manufactures (ASM) years, data are estimates based on a representative sample of establishments canvassed annually and may differ from results of a complete canvass of all establishments. ASM publication shows percentage standard errors. Unless otherwise noted, for data prior to 1967, see 1967 Census of Manufactures, vol. II, table 1 of the Industry chapter.

<sup>2</sup>For the census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

<sup>3</sup>Includes establishments with payroll at any time during year.

<sup>4</sup>Effective with the 1982 Economic Censuses, uniform instructions for reporting inventories were introduced for all sector reports. Up to 1982, respondents were permitted to value inventories using any generally accepted accounting method (FIFO, LIFO, market, to name a few). In 1982, LIFO users were asked to first report inventory values prior to the LIFO adjustment and then to report the LIFO reserve and the LIFO value after adjustment for the reserve.

Because of this change in reporting instructions, the 1982 data for inventories and value added by manufacture included in the tables of this report are not comparable to the prior-year data shown above and in historical census of manufactures and annual survey of manufactures publications. Inventories and value added data estimated on a basis comparable to the historical data, using the reported information for 1982, are shown below:

Industries	End-of-1981 inventories (million dollars)	End-of-1982 inventories (million dollars)	1982 value added by manufacture (million dollars)
Industry 3511, Turbines and turbine generator sets	997.4	899.2	2 134.9
Industry 3519, Internal combustion engines, n.e.c.	1 736.7	1 365.0	3 920.0
Industry 3523, Farm machinery and equipment	2 045.8	1 787.8	5 323.6
Industry 3524, Lawn and garden equipment	508.0	445.9	936.3

See Inventories in appendixes for explanation of the difference between end-of-1981 inventory figure shown in table and corresponding figure shown in footnote.

<sup>5</sup>Industry was defined or redefined for 1972 Census of Manufactures, so data are available only for years shown.



**Table 1b. Selected Operating Ratios for the Industry: 1982 and Earlier Years**

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
<b>INDUSTRY 3511, TURBINES AND TURBINE GENERATOR SETS</b>									
1982 Census.....	26 877	58	1 979	11.54	41	65	66 448	40	57.56
1981 ASM.....	24 515	59	2 046	9.71	44	67	58 173	42	48.04
1980 ASM.....	22 717	60	2 028	9.27	43	67	55 471	41	45.31
1979 ASM.....	20 492	59	2 027	8.48	42	66	47 624	43	39.54
1978 ASM.....	18 499	61	2 017	7.82	44	71	37 438	49	30.55
1977 Census.....	17 382	61	2 065	7.21	46	72	38 054	46	30.40
1976 ASM.....	15 752	60	2 044	6.65	48	72	34 824	45	28.26
1975 ASM.....	13 957	81	2 045	5.92	50	74	28 945	48	23.08
1974 ASM.....	12 820	82	1 994	5.57	48	73	28 292	45	22.89
1973 ASM.....	12 372	61	2 031	5.32	45	70	27 856	44	22.58
1972 Census.....	11 881	62	2 056	5.05	44	69	26 522	45	20.70
1971 ASM.....	11 059	64	2 010	5.00	51	75	22 286	50	17.27
1970 ASM.....	10 281	82	2 057	4.64	54	81	20 195	51	15.78
1969 ASM.....	9 669	64	2 106	4.33	48	75	16 497	59	12.31
1968 ASM.....	9 170	85	2 045	4.03	51	79	16 218	57	12.17
1967 Census.....	8 807	68	2 028	3.92	46	76	16 086	55	11.67
<b>INDUSTRY 3519, INTERNAL COMBUSTION ENGINES, N.E.C.</b>									
1982 Census.....	24 859	66	1 817	12.82	55	76	49 196	51	41.08
1981 ASM.....	24 599	71	1 994	11.68	55	74	58 893	42	41.65
1980 ASM.....	21 978	71	1 973	10.56	54	74	51 059	43	36.49
1979 ASM.....	19 889	73	1 938	9.55	57	77	44 727	44	31.45
1978 ASM.....	18 543	73	2 003	8.69	60	78	41 821	44	28.61
1977 Census.....	17 214	74	1 992	7.96	58	78	38 361	45	26.18
1976 ASM.....	15 450	73	1 959	7.19	58	78	33 085	47	23.18
1975 ASM.....	13 763	72	1 912	6.60	57	78	27 992	49	20.29
1974 ASM.....	13 354	75	2 059	6.02	58	80	27 864	48	18.04
1973 ASM.....	12 125	75	2 049	5.50	53	76	25 501	48	16.55
1972 Census.....	11 036	75	1 998	5.12	53	76	23 951	48	16.05
1971 ASM.....	10 027	74	1 918	4.72	49	73	21 862	46	15.39
1970 ASM.....	9 518	74	1 961	4.38	50	75	19 143	50	13.21
1969 ASM.....	9 089	74	2 036	4.09	53	77	18 219	50	12.02
1968 ASM.....	8 248	75	2 020	3.73	53	77	16 808	49	11.11
1967 Census.....	7 862	75	2 046	3.55	52	76	15 947	49	10.45
<b>INDUSTRY 3523, FARM MACHINERY AND EQUIPMENT</b>									
1982 Census.....	21 532	66	1 806	10.61	49	68	54 167	40	45.77
1981 ASM.....	21 050	70	1 837	10.35	54	73	50 145	42	38.86
1980 ASM.....	19 317	72	1 870	9.36	52	72	45 405	43	33.88
1979 ASM.....	17 545	74	1 939	8.24	56	75	42 932	41	29.83
1978 ASM.....	16 381	74	1 911	7.78	53	73	39 639	41	28.13
1977 Census.....	15 018	73	1 899	7.19	53	72	36 973	41	26.57
1976 ASM.....	13 683	74	1 907	6.55	54	73	33 377	41	23.63
1975 ASM.....	12 840	75	1 973	6.01	55	75	29 989	43	20.18
1974 ASM.....	11 751	78	1 998	5.43	54	76	26 905	44	17.30
1973 ASM.....	10 497	77	1 951	4.94	54	77	22 564	47	15.03
1972 Census.....	9 997	76	1 966	4.66	53	76	21 491	47	14.31
<b>INDUSTRY 3524, LAWN AND GARDEN EQUIPMENT</b>									
1982 Census.....	17 871	70	1 984	8.08	58	72	53 118	34	38.43
1981 ASM.....	16 586	71	1 891	7.52	61	78	43 127	38	31.99
1980 ASM.....	15 438	70	1 888	7.09	58	72	45 852	34	34.47
1979 ASM.....	13 980	76	1 683	6.53	60	74	43 254	32	30.30
1978 ASM.....	12 539	76	1 831	5.91	59	74	36 913	34	26.59
1977 Census.....	11 405	75	1 884	5.14	60	74	32 395	35	22.97
1976 ASM.....	11 075	74	1 978	4.94	62	76	28 567	39	19.57
1975 ASM.....	10 347	72	1 957	4.78	62	77	23 806	43	16.91
1974 ASM.....	9 174	75	1 916	4.28	64	79	25 549	36	17.66
1973 ASM.....	8 922	76	1 952	4.03	63	79	21 590	41	14.55
1972 Census.....	7 995	73	1 940	3.70	62	77	21 894	37	15.47

Note: For qualifications of data, see footnotes on table 1a.



**Table 2. Industry Statistics for Selected States: 1982 and 1977**

[Excludes data for auxiliaries. Includes data for States with 150 employees or more. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1982											1977		
	E¹	All establishments²		All employees		Production workers			Value added by manufacture⁴ (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees³ (1,000)	Value added by manufacture (million dollars)
		Total (no.)	With 20 employees or more (no.)	Number³ (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
<b>INDUSTRY 3511, TURBINES AND TURBINE GENERATOR SETS</b>														
United States .....	-	88	49	32.4	870.8	18.9	37.4	431.6	2 152.9	1 515.0	3 676.3	127.9	40.9	1 556.4
California .....	-	10	3	FF	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	FF	(0)
Connecticut .....	-	8	5	EE	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	CC	(0)
Iowa .....	-	1	1	AA	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(NA)	(NA)
Maine .....	-	2	2	CC	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	CC	(0)
Massachusetts .....	-	11	5	FF	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	FF	(0)
Michigan .....	-	4	3	.2	6.5	.2	.4	4.5	9.5	3.9	13.2	(0)	(NA)	(NA)
Minnesota .....	-	3	2	CC	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	CC	(0)
New Jersey .....	-	5	2	EE	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	EE	(0)
New York .....	-	12	9	FF	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	FF	(0)
North Carolina .....	-	4	3	FF	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	FF	(0)
Ohio .....	-	3	2	AA	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(NA)	(NA)
Pennsylvania .....	-	8	4	FF	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	FF	(0)
South Carolina .....	-	2	2	EE	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	EE	(0)
Wisconsin .....	-	5	3	CC	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	BB	(0)
<b>INDUSTRY 3519, INTERNAL COMBUSTION ENGINES, N.E.C.</b>														
United States .....	-	252	158	79.5	1 976.3	52.4	95.2	1 220.7	3 911.1	5 129.3	9 355.6	599.5	88.8	3 406.5
California .....	-	29	12	FF	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	EE	(0)
Colorado .....	-	3	1	EE	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	CC	(0)
Connecticut .....	-	7	3	FF	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	FF	(0)
Florida .....	E2	11	3	.4	5.2	.3	.5	3.7	7.4	11.6	19.4	1.2	BB	(0)
Illinois .....	-	18	14	FF	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	FF	(0)
Indiana .....	-	12	11	FF	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	FF	(0)
Iowa .....	-	9	9	EE	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	2.7	94.6
Kansas .....	-	2	2	AA	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(NA)	(NA)
Maryland .....	-	1	1	FF	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	FF	(0)
Massachusetts .....	-	4	2	EE	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	EE	(0)
Michigan .....	-	20	15	9.3	265.7	5.6	10.0	148.2	473.1	774.8	1 292.4	(0)	11.3	658.5
Minnesota .....	-	1	1	AA	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	BB	(0)
Missouri .....	-	3	2	CC	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	CC	(0)
New York .....	-	9	4	EE	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	1.5	(NA)
North Carolina .....	-	4	3	CC	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(NA)	(NA)
Ohio .....	-	16	11	FF	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	3.9	183.6
Oklahoma .....	-	6	5	1.5	23.3	1.2	2.1	16.3	65.9	94.5	158.0	3.1	CC	(0)
Pennsylvania .....	-	6	4	.4	9.2	.3	.6	6.5	13.6	26.6	40.9	.8	.5	22.3
South Carolina .....	-	4	3	EE	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	EE	(0)
Tennessee .....	-	3	3	CC	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	BB	(0)
Texas .....	-	25	14	FF	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	EE	(0)
Virginia .....	-	3	1	BB	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(NA)	(NA)
Wisconsin .....	-	28	23	FF	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	FF	(0)
<b>INDUSTRY 3523, FARM MACHINERY AND EQUIPMENT</b>														
United States .....	-	1 903	620	96.0	2 067.1	62.9	113.6	1 205.5	5 200.0	5 217.2	10 741.8	341.1	131.3	4 854.4
Alabama .....	-	23	7	CC	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	1.5	33.2
Arkansas .....	E1	38	12	EE	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	EE	(0)
California .....	E2	206	42	3.7	61.9	2.6	5.0	37.7	99.7	130.1	238.3	9.2	3.7	105.5
Colorado .....	E1	29	14	.8	15.0	.5	1.1	7.6	27.6	30.9	61.2	1.8	EE	(0)
Florida .....	E2	38	6	.6	10.4	.5	.9	6.5	29.5	29.7	54.8	2.0	.6	21.9
Georgia .....	E1	61	24	EE	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	EE	(0)
Idaho .....	E1	29	10	CC	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	.7	9.6
Illinois .....	-	112	58	18.4	451.0	12.2	20.0	278.1	1 238.6	1 248.5	2 590.7	129.8	23.9	969.9
Indiana .....	E1	76	28	2.7	53.4	1.8	3.8	31.0	122.3	104.6	231.5	(0)	4.4	154.1
Iowa .....	-	155	65	FF	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	FF	(0)
Kansas .....	-	112	46	4.6	84.6	3.3	5.7	45.8	185.8	237.2	434.9	10.2	FF	(0)
Kentucky .....	-	12	4	EE	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	FF	(0)
Louisiana .....	-	17	10	CC	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	CC	(0)
Michigan .....	-	50	18	FF	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	FF	(0)
Minnesota .....	-	118	33	FF	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	FF	(0)
Mississippi .....	E1	28	13	.7	8.7	.5	.9	4.9	16.0	29.7	47.2	1.9	1.0	23.3
Missouri .....	-	50	18	2.3	39.5	1.8	2.7	26.0	72.2	141.2	230.0	4.0	2.4	137.1
Nebraska .....	-	102	38	FF	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	FF	(0)
New Jersey .....	E1	8	4	AA	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	AA	(0)
New York .....	E1	26	6	CC	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	EE	(0)
North Carolina .....	E1	34	9	.6	6.8	.4	.8	5.0	14.3	18.9	33.2	(0)	EE	(0)
North Dakota .....	-	48	15	EE	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	EE	(0)
Ohio .....	-	50	14	1.7	35.0	1.2	2.2	20.7	64.2	70.0	132.8	3.3	3.0	65.0
Oklahoma .....	E3	37	4	CC	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	.9	23.7
Oregon .....	E2	27	7	BB	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	CC	(0)
Pennsylvania .....	-	44	8	FF	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	FF	(0)
South Carolina .....	-	5	2	BB	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	AA	(0)
South Dakota .....	-	25	9	CC	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	.7	18.7
Tennessee .....	E1	22	8	EE	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	FF	(0)
Texas .....	E2	114	29	EE	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	FF	(0)
Utah .....	E1	6	2	.2	1.8	.1	.2	1.3	6.2	5.5	11.9	.3	(NA)	(NA)
Virginia .....	E5	11	4	BB	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	BB	(0)
Washington .....	E3	39	8	CC	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	CC	(0)
Wisconsin .....	-	91	39	7.8	171.5	5.3	9.4	92.0	547.1	493.2	1 072.9	27.6	9.7	456.1

See footnotes at end of table.



**Table 2. Industry Statistics for Selected States: 1982 and 1977—Con.**

[Excludes data for auxiliaries. Includes data for States with 150 employees or more. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1982											1977		
	E¹	All establishments²		All employees		Production workers			Value added by manufacture⁴ (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees³ (1,000)	Value added by manufacture (million dollars)
		Total (no.)	With 20 employees or more (no.)	Number³ (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
<b>INDUSTRY 3524, LAWN AND GARDEN EQUIPMENT</b>														
United States .....	-	175	84	17.8	318.1	12.4	24.8	198.7	945.5	1 375.7	2 365.2	51.1	19.5	631.7
Arkansas .....	-	2	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
California .....	-	15	4	1.3	13.5	.7	1.1	5.8	26.7	35.9	64.9	(D)	1.1	21.2
Georgia .....	-	8	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Illinois .....	-	12	8	2.1	44.5	1.5	3.3	31.3	93.8	187.4	265.9	4.8	1.5	32.2
Indiana .....	-	12	8	.7	12.2	.4	.8	5.5	24.7	41.1	71.8	(D)	1.0	34.7
Iowa .....	-	2	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Kansas .....	-	8	4	.4	6.6	.3	.6	4.3	13.0	12.1	25.3	.4	BB	(D)
Kentucky .....	-	3	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Maryland .....	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
Michigan .....	-	3	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Minnesota .....	-	11	6	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Mississippi .....	-	5	5	1.5	21.6	1.1	2.4	14.3	64.4	135.8	201.8	2.8	1.9	39.1
Missouri .....	-	8	3	.3	3.8	.2	.4	2.8	8.7	17.7	28.2	.2	.4	9.2
New York .....	E9	3	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
North Carolina .....	-	4	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
Ohio .....	-	13	8	1.3	22.7	1.1	2.1	17.5	54.8	90.2	141.7	1.1	1.4	32.7
South Carolina .....	-	2	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Tennessee .....	-	4	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Texas .....	-	8	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Wisconsin .....	-	14	10	3.3	83.1	2.2	4.0	50.2	280.0	280.8	569.7	9.0	4.3	163.0

Note: For qualifications of data, see footnotes on table 1a.

¹Payroll and sales data for some small single-unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at time data were tabulated. The following symbols are shown for those States where estimated data based on administrative records data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Includes establishments with payroll at any time during year.

³Statistics for some producing States have been withheld to avoid disclosing data for individual companies. However, for States with 150 employees or more, number of establishments is shown and employment size range is indicated by one of the following symbols: AA—150 to 249 employees; BB—250 to 499 employees; CC—500 to 999 employees; EE—1,000 to 2,499 employees; FF—2,500 employees or more.

⁴Beginning in 1982, all respondents were requested to report their inventories at cost or market prior to adjustment to LIFO cost. This is a change from prior years in which respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, data for inventories and value added by manufacture are not comparable to prior-year data.

**Table 3a. Summary Statistics for the Industry: 1982**

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Turbines and turbine generator sets (SIC 3511)	Internal combustion engines, n.e.c. (SIC 3519)	Farm machinery and equipment (SIC 3523)	Lawn and garden equipment (SIC 3524)
Companies¹ .....	71	200	1 786	151
All establishments² .....	88	252	1 903	175
With 1 to 19 employees .....	39	93	1 282	91
With 20 to 99 employees .....	20	75	470	39
With 100 employees or more .....	29	83	150	45
All employees:				
Average for year .....	32.4	79.5	96.0	17.8
Annual payroll³ .....	870.8	1 976.3	2 067.1	318.1
Production workers:				
Average for year .....	18.9	52.4	62.9	12.4
March .....	20.1	58.3	72.8	15.3
May .....	19.3	54.1	87.0	12.6
August .....	18.6	50.4	60.0	9.7
November .....	17.8	46.6	51.7	12.2
Hours .....	37.4	95.2	113.6	24.8
January to March .....	9.7	28.9	32.2	7.7
April to June .....	9.7	25.8	31.1	6.4
July to September .....	8.9	21.1	25.7	4.4
October to December .....	9.0	19.3	24.4	6.1
Wages .....	431.8	1 220.7	1 205.5	198.7
Value added by manufacture⁴ .....	2 152.9	3 911.1	5 200.0	945.5
Cost of materials, etc.⁵ .....	1 515.0	5 129.3	5 217.2	1 375.7
Materials, parts, containers, etc., consumed .....	1 266.1	4 598.4	4 860.2	1 301.4
Resales .....	22.8	325.0	170.7	47.0
Fuels consumed⁶ .....	25.9	60.1	70.7	10.2
Purchased electric energy⁷ .....	34.7	90.4	77.1	12.8
Contract work .....	165.8	55.4	38.5	4.2
Value of shipments, including resales .....	3 878.3	9 355.8	10 741.8	2 365.2
Value of resales .....	27.4	460.3	245.2	63.0

See footnotes at end of table.



**Table 3a. Summary Statistics for the Industry: 1982—Con.**

[For meaning of abbreviations and symbols, see Introductory text. For explanation of terms, see appendixes]

Item	Turbines and turbine generator sets (SIC 3511)	Internal combustion engines, n.e.c. (SIC 3519)	Farm machinery and equipment (SIC 3523)	Lawn and garden equipment (SIC 3524)
Manufacturers' inventories (see tables 3b and 3c)				
Capital expenditures for plant and equipment <sup>a</sup> -----do-----	133.1	645.8	387.9	59.2
New capital expenditures -----do-----	127.9	599.5	341.1	51.1
New buildings and other structures -----do-----	12.1	59.8	56.2	8.1
New machinery and equipment -----do-----	115.8	539.7	284.9	43.0
Used capital expenditures -----do-----	5.3	46.1	46.8	8.1
Primary product specialization ratio <sup>b</sup> -----percent-----	94	89	94	91
Coverage ratio <sup>c</sup> -----mil. dol.-----	80	87	95	88

<sup>1</sup>For the census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

<sup>2</sup>Includes establishments with payroll at any time during year.

<sup>3</sup>Data on supplemental labor costs are not included in annual payroll, but are shown in table 3d.

<sup>4</sup>Value added by manufacture is computed using inventory data reported on a cost or market basis prior to any adjustment to LIFO cost. See table 3b, footnote 1 for further explanation.

<sup>5</sup>Data on purchased services for the repair of buildings and machinery and for communication services are not included in cost of materials, etc., but are shown in table 3d.

<sup>6</sup>Data on purchased fuels by type were not collected for 1982. See MC82-S-4, Fuels and Electric Energy Consumed, for 1981 data on purchased fuels by type.

<sup>7</sup>Data on quantity of electric energy used for heat and power are included in table 3d.

<sup>8</sup>Data on capital expenditures for new machinery and equipment by type, depreciable assets, retirements, rental payments, and depreciation are included in table 3d.

<sup>9</sup>Represents ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for establishments classified in industry.

<sup>10</sup>Represents ratio of primary products shipped by establishments classified in industry to total shipments of such products by all manufacturing establishments, wherever classified.

**Table 3b. Value of Inventories for the Industry: End of 1981 and 1982**

[Million dollars. For meaning of abbreviations and symbols, see Introductory text. For explanation of terms, see appendixes]

Item	Turbines and turbine generator sets (SIC 3511)		Internal combustion engines, n.e.c. (SIC 3519)		Farm machinery and equipment (SIC 3523)		Lawn and garden equipment (SIC 3524)	
	End of 1981	End of 1982	End of 1981	End of 1982	End of 1981	End of 1982	End of 1981	End of 1982
<b>Total inventories<sup>1</sup> -----</b>	<b>1 578.3</b>	<b>1 501.3</b>	<b>2 176.3</b>	<b>1 775.1</b>	<b>2 006.5</b>	<b>2 231.8</b>	<b>586.8</b>	<b>539.6</b>
Detail by method of valuation:								
Subject to LIFO costing <sup>2</sup> -----	1 397.1	1 356.7	1 405.3	1 117.5	1 451.8	1 105.0	335.1	312.5
LIFO reserve -----	735.8	743.8	484.3	473.8	645.5	482.7	78.8	94.8
LIFO value -----	661.3	613.1	921.0	643.8	806.2	622.3	256.3	217.7
Not subject to LIFO costing -----	158.0	123.2	736.2	626.7	847.5	865.2	218.0	197.1
Valuation method not reported <sup>3</sup> -----	22.6	21.2	34.5	30.8	296.9	260.8	32.2	28.1
Amount subject to LIFO reported without associated reserve and value <sup>4</sup> -----	.8	.2	.2	.2	2.4	1.1	1.5	1.9
Detail by stage of fabrication:								
Finished goods -----	301.5	344.3	709.5	660.4	880.8	823.3	261.0	234.0
Work in process -----	905.9	854.8	1 015.4	749.2	933.0	666.0	109.8	92.9
Materials and supplies -----	370.9	302.3	451.4	365.4	884.8	742.8	215.9	212.8

<sup>1</sup>Effective with the 1982 Economic Censuses, uniform instructions for reporting inventories were introduced for all sector reports. Prior to 1982, respondents were permitted to value inventories using any generally accepted accounting method (LIFO, FIFO, market, to name a few). In 1982, all respondents were requested to report inventories at cost or market. LIFO users were asked to first report inventory values prior to the LIFO adjustment and then to report the LIFO reserve and the LIFO value after adjustment for the reserve. For further explanation, see inventories in appendixes.

<sup>2</sup>Only includes data reported by respondents who (a) indicated amount of inventories subject to LIFO cost, and (b) provided sufficient information to determine associated LIFO reserve and value figures.

<sup>3</sup>Includes data estimated for nonresponse and nonmail administrative records and data reported by respondents who provided total inventory figures without other information.

<sup>4</sup>Includes data reported by respondents who indicated their inventories were subject to LIFO cost, but did not provide associated LIFO reserve and value figures.

**Table 3c. Inventories by Specific Method of Valuation for the Industry: End of 1982**

[For meaning of abbreviations and symbols, see Introductory text. For explanation of terms, see appendixes]

Item	Turbines and turbine generator sets (SIC 3511)		Internal combustion engines, n.e.c. (SIC 3519)		Farm machinery and equipment (SIC 3523)		Lawn and garden equipment (SIC 3524)	
	Percent of total	Absolute standard error (percent)	Percent of total	Absolute standard error (percent)	Percent of total	Absolute standard error (percent)	Percent of total	Absolute standard error (percent)
<b>Total inventories -----</b>	<b>100.0</b>	<b>(X)</b>	<b>100.0</b>	<b>(X)</b>	<b>100.0</b>	<b>(X)</b>	<b>100.0</b>	<b>(X)</b>
Last-in, First-Out (LIFO) methods -----	90.4	(X)	83.0	(X)	49.5	(X)	57.9	(X)
Non-LIFO methods -----	8.2	(X)	35.3	(X)	38.8	(X)	36.5	(X)
Cost basis:								
First-in, First-Out (FIFO) -----	2.1	.2	18.1	.9	11.8	.9	12.8	2.0
Average cost -----	3.1	.4	7.4	.5	5.8	.3	(S)	(S)
Specific or actual cost -----	.5	(Z)	.5	(Z)	3.8	.7	2.8	.8
Standard cost -----	1.5	.1	9.3	.5	18.0	.7	18.2	1.7
Other -----	.9	.1	(Z)	(Z)	1.2	.3	.8	.1
Market basis:								
Market lower than cost -----	(Z)	(Z)	(Z)	(Z)	.2	(Z)	(Z)	(Z)
Market always used -----	(Z)	(Z)	.1	(Z)	.2	.1	.8	.2
Valuation method not reported -----	1.4	(X)	1.7	(X)	11.7	(X)	5.2	(X)
Amount subject to LIFO reported without associated reserve and value -----	(Z)	(X)	(Z)	(X)	(Z)	(X)	.3	(X)

Note: The percentages shown for the LIFO and non-LIFO totals and the categories "valuation method not reported" and "amount subject to LIFO reported..." are based on the census universe estimates included in table 3b. The percentages shown for the specific non-LIFO methods of valuation (e.g., FIFO, etc.) are based on a representative sample of establishments included in the annual survey of manufactures (ASM) panel for 1982 (see appendixes for description of ASM). The absolute standard error of each of the ASM estimates is shown above.



**Table 3d. Supplemental Industry Statistics Based on Sample Estimates: 1982**

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Turbines and turbine generator sets (SIC 3511)		Internal combustion engines, n.e.c. (SIC 3519)		Farm machinery and equipment (SIC 3523)		Lawn and garden equipment (SIC 3524)	
	Amount (million dollars)	Relative standard error of estimate <sup>1</sup> (percent)	Amount (million dollars)	Relative standard error of estimate <sup>1</sup> (percent)	Amount (million dollars)	Relative standard error of estimate <sup>1</sup> (percent)	Amount (million dollars)	Relative standard error of estimate <sup>1</sup> (percent)
<b>Supplemental labor costs:</b>								
Total	240.5	1	587.9	1	653.8	1	73.0	2
Legal costs	71.2	1	168.9	1	186.4	1	30.7	1
Voluntary costs	169.3	1	418.9	1	467.4	1	42.3	3
<b>Purchased services:</b>								
Cost of purchased services for the repair of—								
Buildings and other structures	9.3	1	17.6	1	11.3	3	1.5	14
Response coverage ratio (percent) <sup>2</sup>	87.2	(X)	96.0	(X)	68.7	(X)	71.6	(X)
Machinery	37.4	1	64.3	1	26.4	3	4.4	8
Response coverage ratio (percent) <sup>2</sup>	87.6	(X)	94.4	(X)	72.0	(X)	75.2	(X)
Cost of purchased communication services	18.0	2	24.8	2	19.2	4	3.9	9
Response coverage ratio (percent) <sup>2</sup>	96.8	(X)	97.0	(X)	82.3	(X)	82.8	(X)
<b>Electric energy used for heat and power:</b>								
Purchased:								
Quantity (million kWh)	812.9	1	1 754.0	1	1 576.5	1	246.1	1
Cost	34.7	(X)	90.4	(X)	77.1	(X)	12.8	(X)
Generated less sold (million kWh)	27.4	1	7.5	1	76.9	1	-	-
<b>Gross book value of depreciable assets:</b>								
Total:								
Beginning of year	1 451.9	1	3 920.5	1	3 495.1	1	465.2	3
New capital expenditures	125.5	3	487.5	1	303.0	2	49.8	4
Used capital expenditures	4.7	1	45.2	1	42.0	6	7.9	1
Retirements	23.1	4	114.7	1	353.8	3	24.9	5
End of year	1 559.1	1	4 338.4	1	3 486.3	1	498.0	3
<b>Buildings and other structures:</b>								
Beginning of year	349.3	1	951.0	1	918.9	2	148.4	4
New capital expenditures	11.9	3	50.7	2	40.9	5	7.6	5
Used capital expenditures	(Z)	1	20.7	1	5.7	39	2.1	1
Retirements	1.8	2	14.9	3	63.4	5	6.6	12
End of year	359.5	1	1 007.5	1	902.2	2	151.5	4
<b>Machinery and equipment:</b>								
Beginning of year	1 102.6	1	2 969.5	1	2 578.2	1	316.8	3
New capital expenditures	113.6	3	436.7	1	262.0	2	42.2	4
Automobiles, trucks, etc., for highway use	1.6	27	16.3	2	5.9	9	1.4	35
Computers and peripheral data processing equipment	14.1	1	10.0	1	9.2	2	.6	5
All other	97.5	4	250.0	1	226.5	2	35.5	4
New machinery and equipment, n.s.k. <sup>3</sup>	.4	(S)	160.4	(S)	20.5	(S)	4.7	(S)
Used capital expenditures	4.7	1	24.4	1	36.3	2	5.8	1
Retirements	21.3	5	99.8	1	290.4	3	18.4	3
End of year	1 199.6	1	3 330.9	1	2 584.1	1	345.5	3
<b>Rental payments:</b>								
Total	21.9	2	40.7	2	55.5	5	8.2	8
Buildings and other structures	8.6	5	6.0	6	14.4	10	3.5	20
Machinery and equipment	13.3	1	34.7	2	41.1	5	4.7	7
<b>Depreciation charges during 1982:</b>								
Total	88.1	1	298.5	1	282.0	1	36.8	3
Buildings and other structures	11.8	2	39.0	1	42.8	2	6.8	3
Machinery and equipment	76.6	1	259.5	1	239.2	1	30.0	3

Note: Data for total new capital expenditures, new building expenditures, new machinery expenditures, and total used expenditures are also shown in table 3a. Data in table 3a are census universe totals and may differ from annual survey of manufactures (ASM) sample estimates shown in this table. Data in this table represent best estimates of year-to-year change as measured by the continuing ASM sample. However, they are subject to sampling error and, hence, as estimates of level, are not as reliable as universe figures shown in table 3a.

<sup>1</sup>For description of relative standard error of estimate, see Qualifications of the Data in appendixes.

<sup>2</sup>Measure of extent to which respondents reported each item. Derived for each item by calculating the ratio of weighted employment for those sample establishments that reported the specific inquiry to weighted total employment for all sample establishments classified in industry. (See appendixes for explanation of sample weight.)

<sup>3</sup>Represents total machinery and equipment expenditures for establishments that did not break down their expenditures by specific type.

**Table 4. Industry Statistics by Employment Size of Establishment: 1982**

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	E <sup>1</sup>	All establishments (no.)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
<b>INDUSTRY 3511, TURBINES AND TURBINE GENERATOR SETS</b>												
Total	-	88	32.4	870.8	18.9	37.4	431.8	2 152.9	1 515.0	3 876.3	127.9	1 501.3
Establishments with an average of—												
1 to 4 employees	E6	18	(Z)	.7	(Z)	.1	.4	1.8	1.4	3.2	.1	1.1
5 to 9 employees	E9	8	.1	1.1	(Z)	.1	.7	4.2	3.3	7.6	.3	2.8
10 to 19 employees	E3	13	.2	3.9	.1	.2	2.0	6.3	9.4	16.7	.3	4.5
20 to 49 employees	-	12	.4	8.3	.3	.5	4.5	2.9	22.5	41.2	.8	5.7
50 to 99 employees	E2	8	.5	12.8	.4	.8	9.0	22.4	24.5	49.9	2.3	11.1
100 to 249 employees	-	8	1.2	29.9	.8	1.8	17.9	78.8	50.6	129.7	10.3	39.0
250 to 499 employees	-	5	1.9	48.7	1.2	2.3	25.8	109.8	66.1	190.2	6.8	72.9
500 to 999 employees	-	7	9.3	232.7	5.4	10.9	125.7	635.9	347.2	968.1	29.3	343.0
1,000 to 2,499 employees	-	3	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
2,500 employees or more	-	6	18.8	532.8	10.6	20.8	245.4	1 290.8	989.9	2 269.7	77.8	1 021.0

See footnotes at end of table.



**Table 4. Industry Statistics by Employment Size of Establishment: 1982—Con.**

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	E <sup>1</sup>	All establishments (no.)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
<b>INDUSTRY 3519, INTERNAL COMBUSTION ENGINES, N.E.C.</b>												
Total.....	-	252	79.5	1 976.3	52.4	95.2	1 220.7	3 911.1	5 129.3	9 355.6	599.5	1 775.1
Establishments with an average of—												
1 to 4 employees.....	E9	40	.1	1.5	.1	.1	1.1	3.6	4.7	8.4	.5	1.4
5 to 9 employees.....	E7	24	.2	2.5	.1	.2	1.7	5.5	7.5	13.3	154.2	2.2
10 to 19 employees.....	E5	30	.4	7.3	.3	.6	5.1	13.3	15.5	29.6	2.5	5.3
20 to 49 employees.....	E3	41	1.2	22.8	.8	1.7	13.9	43.8	63.5	106.4	3.7	20.3
50 to 99 employees.....	E1	34	2.5	45.5	1.7	3.4	26.5	89.3	172.7	266.2	21.3	79.6
100 to 249 employees.....	-	29	4.6	99.1	3.4	8.4	66.6	237.8	211.4	447.2	17.3	104.8
250 to 499 employees.....	-	18	6.3	137.0	4.4	7.8	89.5	240.5	265.3	517.2	78.0	130.8
500 to 999 employees.....	-	12	9.1	225.5	5.6	11.2	138.3	825.5	809.5	1 447.4	104.7	269.8
1,000 to 2,499 employees.....	-	19	28.0	617.2	17.1	30.6	398.5	1 089.3	1 634.0	2 761.7	96.1	582.1
2,500 employees or more.....	-	5	29.2	817.9	18.8	33.3	481.7	1 562.5	1 945.1	3 758.1	121.2	578.9
Covered by administrative records <sup>2</sup> .....	E9	54	.4	5.2	.3	.5	3.7	11.5	15.0	26.8	1.5	4.6
<b>INDUSTRY 3523, FARM MACHINERY AND EQUIPMENT</b>												
Total.....	-	1 903	96.0	2 067.1	82.9	113.6	1 205.5	5 200.0	5 217.2	10 741.8	341.1	2 231.9
Establishments with an average of—												
1 to 4 employees.....	E9	549	1.0	12.5	.7	1.4	8.9	30.0	37.7	69.1	3.8	16.3
5 to 9 employees.....	E8	353	2.4	31.5	1.7	3.3	20.4	70.7	90.8	164.2	8.7	37.1
10 to 19 employees.....	E6	381	5.3	78.7	3.7	7.2	48.3	159.5	194.9	359.6	17.4	89.9
20 to 49 employees.....	E2	327	10.1	157.3	6.8	12.9	90.8	303.0	350.3	668.9	18.3	181.2
50 to 99 employees.....	E1	143	10.1	173.5	6.6	12.8	94.5	336.3	422.5	813.4	18.8	232.7
100 to 249 employees.....	E1	101	14.9	265.2	9.4	17.9	140.1	571.9	617.0	1 217.4	34.8	392.7
250 to 499 employees.....	-	18	5.9	110.5	3.6	6.5	58.8	183.5	215.7	430.0	13.0	151.6
500 to 999 employees.....	-	17	11.9	266.8	7.5	13.2	155.8	574.9	591.6	1 187.4	25.1	360.7
1,000 to 2,499 employees.....	-	11	34.6	971.0	22.9	38.3	587.8	2 970.3	2 696.7	5 831.8	201.2	769.6
2,500 employees or more.....	-	3	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records <sup>2</sup> .....	E9	1 006	6.7	82.5	4.7	9.4	53.6	184.5	230.9	420.6	23.3	87.5
<b>INDUSTRY 3524, LAWN AND GARDEN EQUIPMENT</b>												
Total.....	-	175	17.8	316.1	12.4	24.8	198.7	945.5	1 375.7	2 365.2	51.1	539.6
Establishments with an average of—												
1 to 4 employees.....	E9	43	.1	1.2	.1	.1	.8	2.6	4.8	7.5	.1	4.1
5 to 9 employees.....	E7	26	.2	2.2	.1	.2	1.4	5.2	8.4	13.8	.3	4.3
10 to 19 employees.....	E4	22	.3	4.7	.2	.4	2.8	9.0	16.6	26.7	.4	9.5
20 to 49 employees.....	E2	29	.8	12.7	.6	1.2	7.9	36.3	48.5	84.5	11.1	18.9
50 to 99 employees.....	-	10	.7	10.6	.5	1.1	8.9	21.2	48.8	73.5	2.1	22.5
100 to 249 employees.....	-	19	3.0	45.8	2.2	4.3	27.0	128.6	223.7	366.5	5.9	89.7
250 to 499 employees.....	-	19	7.2	122.6	5.2	10.7	79.4	373.0	597.8	989.7	21.7	273.3
500 to 999 employees.....	E1	5	5.4	118.2	3.4	8.5	72.5	369.8	427.1	803.0	9.6	117.4
1,000 to 2,499 employees.....	-	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records <sup>2</sup> .....	E9	63	.5	8.0	.3	.8	3.7	12.8	21.0	34.4	.7	10.7

Note: For qualifications of data, see footnotes on table 1a. Data shown as a (D) are included in underscored figures above.

<sup>1</sup>Payroll and sales data for some small single-unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at time data were tabulated. The following symbols are shown for those States where estimated data based on administrative records data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

<sup>2</sup>Report forms were not mailed to small single-unit companies with up to 20 employees (cutoff varied by industry). Payroll and sales data for 1982 were obtained from administrative records supplied by other agencies of the Federal Government. Those data were then used in conjunction with industry averages to estimate the items shown. Data are also included in respective size classes shown.

**Table 5a. Industry Statistics by Industry and Primary Product Class Specialization: 1982**

[Table presents selected statistics for establishments according to their degree of specialization in products primary to their industry. Measures of plant specialization shown are (1) industry specialization: ratio of primary product shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment; and (2) product class specialization: ratio of largest primary product class shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment. See appendix for method of computing ratios. Statistics for establishments with specialization ratios of less than 75 percent are included in total lines but are not shown as a separate class. In addition, data may not be shown for various reasons; e.g., to avoid disclosing operations of individual companies. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes.]

Industry or product class code	Industry or product class by percent of specialization	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
3511	<b>Turbines and turbine generator sets:</b>										
	Entire industry.....	88	32.4	870.8	18.9	37.4	431.6	2 152.9	1 515.0	3 676.3	127.9
	Establishments with 75 percent specialization or more ..	78	27.4	748.9	16.2	32.1	368.6	1 933.9	1 332.2	3 260.9	115.5
35111	<b>Steam, gas, and hydraulic turbine generator sets:</b>										
	Establishments with this product class primary .....	12	4.6	111.3	2.3	4.7	55.2	234.4	173.3	411.5	14.9
	Establishments with 75 percent specialization or more in class .....	7	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
35112	<b>Steam, gas, and hydraulic turbines and parts:</b>										
	Establishments with this product class primary .....	42	27.5	753.0	16.3	32.3	373.0	1 902.5	1 329.6	3 235.8	112.0
	Establishments with 75 percent specialization or more in class .....	34	16.6	471.6	10.2	19.7	231.2	1 318.4	766.6	2 069.4	80.9

See footnotes at end of table.



**Table 5a. Industry Statistics by Industry and Primary Product Class Specialization: 1982—**  
**Con.**

[Table presents selected statistics for establishments according to their degree of specialization in products primary to their industry. Measures of plant specialization shown are (1) industry specialization: ratio of primary product shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment; and (2) product class specialization: ratio of largest primary product class shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment. See appendix for method of computing ratios. Statistics for establishments with specialization ratios of less than 75 percent are included in total lines but are not shown as a separate class. In addition, data may not be shown for various reasons; e.g., to avoid disclosing operations of individual companies. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes.]

Industry or product class code	Industry or product class by percent of specialization	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
<b>3519</b>	<b>Internal combustion engines, n.e.c.:</b>										
	Entire industry .....	252	79.5	1 978.3	52.4	95.2	1 220.7	3 911.1	5 129.3	9 355.6	599.5
	Establishments with 75 percent specialization or more ..	223	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
<b>35191</b>	<b>Gasoline and gas-gasoline engines:</b>										
	Establishments with this product class primary .....	10	11.4	286.2	8.7	16.6	213.3	483.1	446.0	983.4	28.0
	Establishments with 75 percent specialization or more in class .....	7	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
<b>35193</b>	<b>Diesel, semidiesel, and dual fuel engines, nonautomotive:</b>										
	Establishments with this product class primary .....	8	9.2	234.9	6.4	9.7	149.5	730.4	970.4	1 796.2	47.8
	Establishments with 75 percent specialization or more in class .....	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
<b>35194</b>	<b>Diesel, semidiesel, and dual fuel engines, automotive:</b>										
	Establishments with this product class primary .....	8	16.0	471.7	9.0	17.0	253.0	690.1	1 213.9	2 005.5	134.4
	Establishments with 75 percent specialization or more in class .....	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
<b>35195</b>	<b>Outboard motors:</b>										
	Establishments with this product class primary .....	8	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
	Establishments with 75 percent specialization or more in class .....	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
<b>35196</b>	<b>Gas engines, except gas turbines:</b>										
	Establishments with this product class primary .....	5	1.0	25.1	.7	1.5	18.9	76.0	61.1	133.5	(D)
	Establishments with 75 percent specialization or more in class .....	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
<b>35197</b>	<b>Tank and converted internal combustion engines:</b>										
	Establishments with this product class primary .....	21	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
	Establishments with 75 percent specialization or more in class .....	13	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
<b>35199</b>	<b>Parts for internal combustion engines:</b>										
	Establishments with this product class primary .....	109	30.7	707.9	20.5	37.3	431.0	1 310.9	1 294.5	2 633.0	202.4
	Establishments with 75 percent specialization or more in class .....	84	16.6	358.9	11.4	21.1	229.0	635.2	571.1	1 223.5	158.8
<b>3523</b>	<b>Farm machinery and equipment:</b>										
	Entire industry .....	1 903	96.0	2 067.1	62.9	113.6	1 205.5	5 200.0	5 217.2	10 741.8	341.1
	Establishments with 75 percent specialization or more ..	1 805	87.4	1 897.5	57.7	104.3	1 115.3	4 903.2	4 868.1	10 060.2	324.6
<b>35231</b>	<b>Wheel tractors and attachments:</b>										
	Establishments with this product class primary .....	10	10.2	255.3	7.4	11.5	155.2	948.5	1 514.0	2 513.4	116.4
	Establishments with 75 percent specialization or more in class .....	8	10.0	249.9	7.3	11.4	153.3	936.7	1 505.8	2 493.6	116.1
<b>35232</b>	<b>Dairy equipment, sprayers, elevators, and blowers:</b>										
	Establishments with this product class primary .....	77	5.4	105.9	3.3	6.3	50.5	200.9	244.9	464.4	18.0
	Establishments with 75 percent specialization or more in class .....	41	2.7	48.1	1.8	3.5	27.1	106.1	122.8	236.3	9.3
<b>35233</b>	<b>Planting, seeding, and fertilizing machinery:</b>										
	Establishments with this product class primary .....	59	7.5	190.7	4.8	8.8	111.3	516.3	346.7	914.1	15.3
	Establishments with 75 percent specialization or more in class .....	33	1.8	31.9	1.2	2.4	19.6	54.3	79.7	134.4	2.8
<b>35234</b>	<b>Harrows, rollers, pulverizers, stalk cutters:</b>										
	Establishments with this product class primary .....	51	4.3	84.9	2.8	5.1	42.0	143.1	180.3	330.6	11.8
	Establishments with 75 percent specialization or more in class .....	20	1.6	27.0	1.1	2.1	15.1	44.4	68.2	118.2	4.4
<b>35235</b>	<b>Harvesting machinery, except for hay and straw:</b>										
	Establishments with this product class primary .....	51	13.6	324.9	9.6	16.1	216.5	1 024.2	915.6	2 007.2	37.3
	Establishments with 75 percent specialization or more in class .....	21	10.1	255.5	7.2	11.8	173.2	881.9	803.9	1 750.2	31.3
<b>35238</b>	<b>Haying machinery:</b>										
	Establishments with this product class primary .....	12	7.5	184.2	3.8	8.5	81.6	413.2	289.3	719.4	22.4
	Establishments with 75 percent specialization or more in class .....	7	.5	7.3	.3	.6	3.4	13.8	23.6	40.8	2.3
<b>35237</b>	<b>Plows and listers:</b>										
	Establishments with this product class primary .....	12	.4	8.1	.3	.6	4.2	17.9	18.4	35.5	(D)
	Establishments with 75 percent specialization or more in class .....	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
<b>35238</b>	<b>All other farm machinery and equipment:</b>										
	Establishments with this product class primary .....	255	17.2	309.1	10.6	20.3	160.2	590.0	668.5	1 307.6	32.9
	Establishments with 75 percent specialization or more in class .....	170	8.8	149.3	5.6	10.8	76.7	286.6	361.2	663.5	16.3
<b>35239</b>	<b>Parts for farm machinery:</b>										
	Establishments with this product class primary .....	95	17.0	424.3	11.5	21.0	271.3	935.0	555.6	1 541.7	49.3
	Establishments with 75 percent specialization or more in class .....	55	11.5	314.5	7.9	14.6	205.3	757.5	359.0	1 156.0	41.2
<b>3523A</b>	<b>Commercial turf and grounds mowing equipment:</b>										
	Establishments with this product class primary .....	23	2.3	40.7	1.6	3.0	23.0	114.5	122.0	239.0	5.3
	Establishments with 75 percent specialization or more in class .....	19	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
<b>3523B</b>	<b>Other commercial turf and grounds care equipment:</b>										
	Establishments with this product class primary .....	8	.1	1.7	.1	.1	.9	4.4	4.8	10.5	.1
	Establishments with 75 percent specialization or more in class .....	8	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
<b>3524</b>	<b>Lawn and garden equipment:</b>										
	Entire industry .....	175	17.8	318.1	12.4	24.6	198.7	945.5	1 375.7	2 365.2	51.1
	Establishments with 75 percent specialization or more ..	160	15.7	274.4	10.8	20.8	164.4	835.7	1 225.9	2 102.5	49.2
<b>35241</b>	<b>Consumer nonriding lawn and garden equipment:</b>										
	Establishments with this product class primary .....	51	10.1	161.9	7.3	14.7	105.7	512.0	851.1	1 383.7	25.5
	Establishments with 75 percent specialization or more in class .....	36	5.4	75.9	3.6	7.1	41.8	232.6	433.3	682.8	15.4

See footnotes at end of table.



**Table 5a. Industry Statistics by Industry and Primary Product Class Specialization: 1982—**  
**Con.**

[Table presents selected statistics for establishments according to their degree of specialization in products primary to their industry. Measures of plant specialization shown are (1) industry specialization: ratio of primary product shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment; and (2) product class specialization: ratio of largest primary product class shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment. See appendix for method of computing ratios. Statistics for establishments with specialization ratios of less than 75 percent are included in total lines but are not shown as a separate class. In addition, data may not be shown for various reasons; e.g., to avoid disclosing operations of individual companies. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes.]

Industry or product class code	Industry or product class by percent of specialization	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
35243	Parts for consumer nonriding lawn and garden equipment: Establishments with this product class primary -----	9	.7	9.5	.5	1.0	6.1	23.0	22.7	45.1	.5
	Establishments with 75 percent specialization or more in class -----	6	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
35244	Consumer riding lawn and garden equipment: Establishments with this product class primary -----	15	5.1	115.0	3.2	8.2	66.4	351.3	417.4	787.6	12.1
	Establishments with 75 percent specialization or more in class -----	6	1.7	31.7	1.1	2.2	17.8	118.7	156.6	283.4	5.0
35245	Parts for consumer riding lawn and garden equipment: Establishments with this product class primary -----	12	1.1	21.4	.8	1.6	13.8	38.4	51.8	94.4	(D)
	Establishments with 75 percent specialization or more in class -----	8	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)

Note: For qualifications of data, see footnotes on table 1a.

**Table 5b. Industry-Product Analysis—Value of Shipments and Primary Product Shipments, Specialization and Coverage Ratios for the Industry: 1982 and Earlier Census Years**

[An establishment is assigned to an industry based on shipment values of products representing largest amount considered primary to an industry. Frequently, establishment shipments comprise mixtures of products assigned to an industry (primary), those considered primary to other industries (secondary), and receipts for activities such as merchandising or contract work. Columns A-D show this product pattern for an industry, and column E shows primary product specialization ratio. The extent to which an industry's primary products are shipped by establishments classified in and out of an industry is shown in columns F-H and coverage ratio is shown in column I. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes.]

Industry and product group code	Industry and census year	Value of shipments					Value of primary product shipments			
		Total (million dollars)	Primary products (million dollars)	Secondary products (million dollars)	Miscellaneous receipts (million dollars)	Primary product specialization ratio Col. B ÷ Col. B + C (percent)	Total made in all industries (million dollars)	Made in this industry (million dollars)	Made in other industries (million dollars)	Coverage ratio Col. B ÷ Col. F (percent)
		A	B	C	D	E	F	G	H	I
3511	Turbines and turbine generator sets ----- 1982..	3 676.3	2 948.1	186.1	542.1	94	3 662.3	2 948.1	714.3	80
	1977..	2 733.7	2 314.1	213.8	206.0	92	2 813.1	2 314.1	499.0	82
	1972..	2 189.0	1 877.1	170.6	141.3	92	2 079.7	1 877.1	202.6	90
3519	Internal combustion engines, n.e.c. ----- 1982..	9 355.6	7 818.0	965.3	572.3	89	8 972.4	7 818.0	1 154.4	87
	1977..	7 696.5	6 658.8	645.3	392.4	91	7 548.0	6 658.8	889.2	88
	1972..	3 318.4	2 864.2	270.3	183.9	91	3 353.4	2 864.2	489.2	85
3523	Farm machinery and equipment ----- 1982..	10 741.8	9 835.3	597.0	309.5	94	10 370.0	9 835.3	534.7	95
	1977..	10 281.7	9 082.8	808.3	390.6	92	9 548.9	9 082.8	466.1	95
	1972..	4 531.4	3 907.9	430.0	193.5	90	4 143.5	3 907.9	235.8	94
3524	Lawn and garden equipment ----- 1982..	2 365.2	2 096.9	197.0	71.2	91	2 385.2	2 096.9	288.3	88
	1977..	1 569.5	1 427.5	116.2	25.8	92	1 747.2	1 427.5	319.7	82
	1972..	1 059.1	931.9	105.9	21.3	90	1 143.4	931.9	211.5	82



Table 5c-1. Industry-Product Analysis—Shipments by Product Class and Industry: 1982

[Million dollars. Table shows where products of an industry (referred to as primary and listed in table 6a) are made and what products are made by establishments classified in an industry. Read down an industry column to find what products are produced in an industry. Only those product groups that have at least \$2 million in shipments from establishments classified in one of industries included in this chapter are shown. Read across to determine where products of industries in this chapter are produced. To extent that some of primary products are made in industries not included in this chapter, value of such shipments is shown in "Other industries" column. Specified "Other industries" are listed in table 5c-2 if they account for more than \$5 million of products primary to this chapter. For meaning of abbreviations and symbols, see explanatory text. For explanation of terms, see appendixes]

1982 product code	Product group, product class, and miscellaneous receipts	All industries	Turbines and turbine generator sets (SIC 3511)	Internal combustion engines, n.e.c. (SIC 3519)	Farm machinery and equipment (SIC 3523)	Lawn and garden equipment (SIC 3524)	Other industries
	<b>Total</b> .....	(X)	3 676.3	9 355.6	10 741.8	2 365.2	(X)
	<b>Primary products</b> .....	(X)	2 948.1	7 818.0	9 835.3	2 096.9	(X)
	<b>Secondary products</b> .....	(X)	186.1	965.3	597.0	197.0	(X)
	<b>Miscellaneous receipts</b> .....	(X)	542.1	572.3	309.5	71.2	(X)
3511-	<b>Turbines and turbine generator sets</b> .....	3 662.3	2 948.1	(D)	-	-	(D)
35111	Steam, gas, and hydraulic turbine generator sets.....	786.5	722.4	-	-	-	64.1
35112	Steam, gas, and hydraulic turbines and parts.....	2 846.9	2 197.1	(D)	-	-	(D)
35110	Turbines and turbine generator sets, n.s.k.....	28.9	28.6	-	-	-	.3
3519-	<b>Internal combustion engines, n.e.c.</b> .....	8 972.4	(D)	7 818.0	(D)	(D)	(D)
35191	Gasoline and gas-gasoline engines.....	1 001.8	-	903.9	(D)	(D)	(D)
35193	Diesel, semidiesel, and dual fuel engines, nonautomotive.....	1 548.2	-	1 374.4	-	-	173.9
35194	Diesel, semidiesel, and dual fuel engines, automotive.....	1 715.6	-	(D)	-	-	(D)
35195	Outboard motors.....	(D)	-	(D)	-	-	(D)
35196	Gas engines, except gas turbines.....	99.6	-	(D)	-	-	(D)
35197	Tank and converted internal combustion engines.....	(D)	-	(D)	-	(D)	(D)
35199	Parts for internal combustion engines.....	3 405.7	(D)	2 832.9	(D)	(D)	(D)
35190	Internal combustion engines, n.s.k.....	58.2	-	57.6	-	(D)	(D)
3523-	<b>Farm machinery and equipment</b> .....	10 370.0	-	(D)	9 835.3	(D)	507.7
35231	Wheel tractors and attachments.....	2 321.9	-	-	2 256.9	(D)	(D)
35232	Dairy equipment, sprayers, elevators, and blowers.....	382.2	-	-	365.1	(D)	(D)
35233	Planting, seeding, and fertilizing machinery.....	566.5	-	-	559.9	(D)	(D)
35234	Harrows, rollers, pulverizers, stalk cutters.....	298.7	-	-	291.8	(D)	(D)
35235	Harvesting machinery, except for hay and straw.....	1 854.1	-	-	1 834.0	(D)	(D)
35236	Haying machinery.....	444.8	-	-	397.3	(D)	(D)
35237	Plows and listers.....	125.9	-	-	122.2	(D)	(D)
35238	All other farm machinery and equipment.....	1 156.3	-	-	1 090.0	.6	65.7
35239	Parts for farm machinery.....	2 327.6	-	(D)	2 062.4	(D)	(D)
3523A	Commercial turf and grounds mowing equipment.....	203.0	-	-	197.2	(D)	(D)
35233	Other commercial turf and grounds care equipment.....	35.2	-	-	16.0	(D)	(D)
35230	Farm machinery and equipment, n.s.k.....	653.7	-	-	642.5	(D)	(D)
3524-	<b>Lawn and garden equipment</b> .....	2 385.2	-	-	(D)	2 096.9	(D)
35241	Consumer nonriding lawn and garden equipment.....	1 167.5	-	-	12.8	(D)	(D)
35243	Parts for consumer nonriding lawn and garden equipment.....	148.4	-	-	(D)	141.9	(D)
35244	Consumer riding lawn and garden equipment.....	765.2	-	-	(D)	(D)	(D)
35245	Parts for consumer riding lawn and garden equipment.....	250.9	-	-	10.2	227.5	13.3
35240	Lawn and garden equipment, n.s.k.....	53.3	-	-	(D)	51.0	(D)
	<b>OTHER SHIPMENTS BY FOUR-DIGIT PRODUCT GROUP</b>						
2451-	Mobile homes.....	(X)	-	-	(D)	-	(X)
2599-	Furniture and fixtures, n.e.c.....	(X)	-	-	-	(D)	(X)
2653-	Corrugated and solid fiber boxes.....	(X)	-	-	-	(D)	(X)
2992-	Lubricating oils and greases.....	(X)	-	10.1	-	-	(X)
3317-	Steel pipe and tubes.....	(X)	-	-	(D)	-	(X)
3322-	Malleable iron castings.....	(X)	-	(D)	-	-	(X)
3448-	Prefabricated metal buildings.....	(X)	-	-	4.0	-	(X)
3451-	Screw machine products.....	(X)	-	3.8	-	-	(X)
3462-	Iron and steel forgings.....	(X)	-	-	(D)	-	(X)
3465-	Automotive stampings.....	(X)	-	-	-	(D)	(X)
3469-	Metal stampings, n.e.c.....	(X)	-	-	-	(D)	(X)
3494-	Valves and pipe fittings.....	(X)	(D)	34.1	3.3	-	(X)
3531-	Construction machinery.....	(X)	-	(D)	214.4	(D)	(X)
3536-	Hoists, cranes, and monorails.....	(X)	-	(D)	4.0	-	(X)
3541-	Machine tools, metal cutting types.....	(X)	-	-	-	(D)	(X)
3545-	Machine tool accessories.....	(X)	-	(D)	-	-	(X)
3546-	Power driven hand tools.....	(X)	-	(D)	-	(D)	(X)
3552-	Textile machinery.....	(X)	-	(D)	-	-	(X)
3561-	Pumps and pumping equipment.....	(X)	4.9	(D)	20.0	-	(X)
3563-	Air and gas compressors.....	(X)	27.7	(D)	(D)	-	(X)
3568-	Power transmission equipment, n.e.c.....	(X)	-	-	(D)	-	(X)
3576-	Scales and balances, except laboratory.....	(X)	-	-	(D)	-	(X)
3585-	Refrigeration and heating equipment.....	(X)	(D)	(D)	(D)	-	(X)
3592-	Carburetors, pistons, rings, and valves.....	(X)	-	25.4	-	-	(X)
3635-	Household vacuum cleaners.....	(X)	-	-	-	(D)	(X)
3639-	Household appliances, n.e.c.....	(X)	-	-	(D)	-	(X)
3699-	Electrical equipment and supplies, n.e.c.....	(X)	-	(D)	-	-	(X)
3713-	Truck and bus bodies.....	(X)	-	-	(D)	-	(X)
3714-	Motor vehicle parts and accessories.....	(X)	-	153.1	(D)	-	(X)
3715-	Truck trailers.....	(X)	-	-	7.5	-	(X)
3724-	Aircraft engines and engine parts.....	(X)	(D)	(D)	-	-	(X)
3829-	Measuring and controlling devices, n.e.c.....	(X)	-	-	(D)	-	(X)
	<b>MISCELLANEOUS RECEIPTS</b>						
93000 00	Receipts for work done for others on their materials.....	(X)	(D)	(D)	29.2	4.9	(X)
99980 00	Miscellaneous receipts, including receipts for repair work, sales of scrap and refuse, etc.....	(X)	(D)	2.1	1.9	-	(X)
99980 13	Sales of scrap and refuse.....	(X)	(D)	8.7	7.1	(D)	(X)
99980 31	Receipts for installation or construction of products of the establishment.....	(X)	(D)	(D)	(D)	-	(X)
99980 41	Receipts for research and development work.....	(X)	36.3	(D)	(D)	-	(X)
99980 61	Receipts for repair work.....	(X)	195.8	12.0	1.0	-	(X)
99980 98	Other miscellaneous receipts, including receipts for repair work, etc.....	(X)	207.2	3.6	23.6	2.3	(X)
99989 00	Sales of products bought and resold without further manufacture, processing, or assembly at establishment.....	(X)	27.4	460.3	245.2	63.0	(X)



Table 5c-2. **Industry—Product Analysis—Other Industries With Shipments of Primary Products: 1982**

[Million dollars. Table is a continuation of table 5c and shows where products of industries in this chapter (referred to as primary products and listed in table 6a) are made. To extent that some of primary products are made in industries not included in this chapter, value of such shipments is shown in "Other industries" column of table 5c-1. Specified "Other industries" are listed in this table if they account for more than \$5 million of products primary to this chapter. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

1982 product code	Other Industries	Value	1982 product code	Other Industries	Value
<b>3511-</b>	<b>TURBINES AND TURBINE GENERATOR SETS</b>		<b>3523-</b>	<b>FARM MACHINERY AND EQUIPMENT</b>	
3489 Ordnance and accessories, n.e.c. ....	(D)		3312 Blast furnaces and steel mills .....	(D)	
3561 Pumps and pumping equipment .....	(D)		3321 Gray iron foundries .....	(D)	
3563 Air and gas compressors .....	53.3		3443 Fabricated plate work (boiler shops) .....	8.4	
3564 Blowers and fans .....	(D)		3444 Sheet metal work .....	17.6	
3621 Motors and generators .....	18.0		3448 Prefabricated metal buildings .....	(D)	
3724 Aircraft engines and engine parts .....	576.7		3531 Construction machinery .....	252.9	
			3551 Food products machinery .....	41.7	
<b>3519-</b>	<b>INTERNAL COMBUSTION ENGINES, N.E.C.</b>		3564 Blowers and fans .....	(D)	
3531 Construction machinery .....	(D)		3569 General industrial machinery, n.e.c. ....	(D)	
3549 Metalworking machinery, n.e.c. ....	(D)		3634 Electric housewares and fans .....	(D)	
3563 Air and gas compressors .....	(D)		3714 Motor vehicle parts and accessories .....	36.0	
3621 Motors and generators .....	(D)		3799 Transportation equipment, n.e.c. ....	26.0	
3711 Motor vehicles and car bodies .....	(D)		<b>3524-</b>	<b>LAWN AND GARDEN EQUIPMENT</b>	
3714 Motor vehicle parts and accessories .....	239.7		3465 Automotive stampings .....	(D)	
3724 Aircraft engines and engine parts .....	(D)		3546 Power driven hand tools .....	(D)	
3743 Railroad equipment .....	(D)		3553 Woodworking machinery .....	(D)	
			3751 Motorcycles, bicycles, and parts .....	(D)	

Table 6a. **Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977**

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>	
			Quantity <sup>2</sup>	Value (million dollars)		Quantity <sup>2</sup>	Value (million dollars)
	<b>TURBINES AND TURBINE GENERATOR SETS</b>						
3511- --	Total -----	(NA)	(X)	3 662.3	(NA)	(X)	2 813.1
35111 --	Steam, gas, and hydraulic turbine generator set units and parts:						
35111 00	Steam, gas, and hydraulic generator sets manufactured on a common base; generators designed for use with steam, gas, or hydraulic turbines; and parts thereof -----	30	(X)	786.5	20	(X)	1 369.2
35112 --	Steam, gas, and hydraulic turbines and parts -----	(NA)	(X)	2 846.9	(NA)	(X)	1 415.4
	Mechanical drive steam turbines and gear turbines, including the value of the gears:						
35112 03	Marine and Navy ----- number-----	3	(D)	( <sup>3</sup> )	4	113	71.1
	Horsepower capacity (rated or normal):						
35112 01	Less than 1,000 hp ----- do-----	(NA)	(D)	(X)	(NA)	( <sup>4</sup> )	(X)
35112 08	1,000 to 9,999 hp ----- do-----	(NA)	(D)	(X)	(NA)	65	(X)
35112 09	10,000 hp or more ----- do-----	(NA)	(D)	(X)	(NA)	448	(X)
35112 13	Land ----- do-----	10	2 314	786.9	8	2 818	352.1
	Horsepower capacity (rated or normal):						
35112 15	Less than 50 hp ----- do-----	(NA)	1 242	(X)	(NA)	815	(X)
35112 16	50 to 499 hp ----- do-----	(NA)			(NA)	1 366	(X)
35112 17	500 to 999 hp ----- do-----	(NA)	365	(X)	(NA)	226	(X)
35112 18	1,000 to 9,999 hp ----- do-----	(NA)	606	(X)	(NA)	156	(X)
35112 19	10,000 hp or more ----- do-----	(NA)	101	(X)	(NA)	55	(X)
35112 61	Hydraulic turbines (all sizes) ----- do-----	3	(D)	( <sup>3</sup> )	2	(D)	(D)
35112 71	Parts and accessories for hydraulic turbines -----	3	(X)	142.1	3	(X)	(D)
35112 72	Parts and accessories for steam turbines -----	13	(X)	587.1	10	(X)	(D)
	Gas turbines (except aircraft):						
35112 75	Less than 10,000 hp ----- number-----	12	(S)	503.3	4	2 315	228.7
35112 77	10,000 hp or more ----- do-----	9	(S)	378.6	3	(S)	195.4
35112 81	Parts and accessories for gas turbines, except aircraft -----	24	(X)	450.4	9	(X)	297.0
35112 00	Steam, gas, and hydraulic turbines and parts, n.s.k. -----	(NA)	(X)	.6	(NA)	(X)	12.0
35110 00	Turbines and turbine generator sets, n.s.k., typically for establishments with 5 employees or more (see note) -----	(NA)	(X)	28.9	(NA)	(X)	13.8
35110 02	Turbines and turbine generator sets, n.s.k., typically for establishments with less than 5 employees (see note) -----	(NA)	(X)	-	(NA)	(X)	14.7

See footnotes at end of table.



**Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977—Con.**

(Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text)

1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>	
			Quantity <sup>2</sup>	Value (million dollars)		Quantity <sup>2</sup>	Value (million dollars)
	<b>INTERNAL COMBUSTION ENGINES, N.E.C.</b>						
3519- --	Total -----	(NA)	(X)	8 972.4	(NA)	(X)	7 548.0
35191 --	Gasoline and gas-gasoline engines, except outboard, aircraft, automobile, truck, bus, and tank:						
35191 00	Gasoline and gas-gasoline engines, except outboard, aircraft, automobile, truck, bus, and tank: As reported in the census of manufactures ----- As reported in the Current Industrial Report MA-35L, Internal Combustion Engines ----- thousands -----	24 (NA)	(X)	<sup>\$1</sup> 001.8 999.9	18 (NA)	(X)	<sup>\$</sup> 92.9 888.4
35191 01	Less than 3 hp ----- do-----						
35191 02	3 to less than 6 hp ----- do-----						
35191 03	6 to less than 11 hp ----- do-----						
35191 11	11 to less than 15 hp ----- do-----						
35191 12	15 to less than 21 hp ----- do-----						
35191 13	21 to less than 31 hp ----- do-----						
35191 14	31 to less than 51 hp ----- do-----						
35191 15	51 to less than 61 hp ----- do-----	(NA)	8 381.4	999.9	(NA)	10 967.9	888.4
35191 16	61 to less than 71 hp ----- do-----						
35191 17	71 to less than 91 hp ----- do-----						
35191 18	91 to less than 151 hp ----- do-----						
35191 19	151 to less than 201 hp ----- do-----						
35191 20	201 to less than 301 hp ----- do-----						
35191 21	301 hp or more ----- do-----						
35193 --	Diesel, semidiesel, and dual fuel engines (except automotive):						
35193 00	Diesel, semidiesel, and dual fuel engines (except automotive): As reported in the census of manufactures ----- As reported in the Current Industrial Report MA-35L, Internal Combustion Engines ----- thousands -----	17 (NA)	(X)	<sup>\$1</sup> 548.2 175.8	23 (NA)	(X)	<sup>\$1</sup> 587.4 1 523.5
35193 11	Less than 21 hp ----- do-----						
35193 12	21 to less than 51 hp ----- do-----						
35193 13	51 to less than 71 hp ----- do-----						
35193 14	71 to less than 101 hp ----- do-----	(NA)	99.1	462.0	(NA)	163.6	397.0
35193 15	101 to less than 151 hp ----- do-----						
35193 16	151 to less than 201 hp ----- do-----						
35193 17	201 to less than 251 hp ----- do-----						
35193 18	251 to less than 301 hp ----- do-----						
35193 19	301 to less than 351 hp ----- do-----						
35193 20	351 to less than 401 hp ----- do-----						
35193 21	401 to less than 451 hp ----- do-----						
35193 22	451 to less than 501 hp ----- do-----						
35193 23	501 to less than 601 hp ----- do-----	(NA)	76.7	1 083.7	(NA)	151.6	1 126.5
35193 24	601 to less than 701 hp ----- do-----						
35193 25	701 to less than 801 hp ----- do-----						
35193 26	801 to less than 1,001 hp ----- do-----						
35193 27	1,001 to less than 1,501 hp ----- do-----						
35193 28	1,501 hp or more ----- do-----						
35194 --	Diesel, semidiesel, and dual fuel engines (automotive):						
35194 00	Diesel, semidiesel, and dual fuel engines, automotive: As reported in the census of manufactures ----- As reported in the Current Industrial Report MA-35L, Internal Combustion Engines ----- thousands -----	6 (NA)	(X)	<sup>\$1</sup> 715.6 1 715.6	11 (NA)	(X)	<sup>\$1</sup> 322.2 221.0
35194 11	Less than 151 hp ----- do-----				(NA)	<sup>(9)</sup>	<sup>(9)</sup>
35194 12	151 to less than 201 ----- do-----				(NA)	<sup>\$16.9</sup>	<sup>\$55.5</sup>
35194 13	201 to less than 226 hp ----- do-----				(NA)	28.6	106.9
35194 14	226 to less than 251 hp ----- do-----	(NA)	(D)	1 715.6	(NA)	25.6	135.9
35194 15	251 to less than 276 hp ----- do-----				(NA)	16.4	83.8
35194 18	276 hp or more ----- do-----				(NA)	133.5	857.3
35195 --	Outboard motors:						
35195 00	Outboard motors (internal combustion) ----- do-----	9	(D)	<sup>(7)</sup>	6	(X)	<sup>(9)</sup>
35196 --	Gas engines (except gas turbines):						
35196 00	Piston-type natural gas, including LPG engines: As reported in the census of manufactures ----- As reported in the Current Industrial Report MA-35L, Internal Combustion Engines ----- thousands -----	10 (NA)	(X)	<sup>\$</sup> 99.6 99.6	6 (NA)	(X)	<sup>\$</sup> 31.9 30.0
35196 11	Less than 501 hp ----- do-----	(NA)	(D)	41.6	(NA)	(D)	10.5
35196 12	501 hp or more ----- do-----	(NA)	(D)	57.9	(NA)	(D)	19.5
35197 --	Tank and converted internal combustion engines -----	(NA)	(X)	<sup>\$1</sup> 143.4	17	(X)	<sup>\$</sup> 813.7
35197 21	Tank engines ----- thousands -----	3	(S)	<sup>\$</sup> 764.1			
35197 51	Converted engines (converted from purchased engines or from engines received from another plant of the same company) ----- do-----	22	(S)	379.3	17	(X)	<sup>\$</sup> 813.7
35197 00	Tank and converted internal combustion engines, n.s.k. -----	(NA)	(X)	-			
35199 --	Parts and accessories for internal combustion engines, except aircraft and gasoline automotive engines and gas turbines -----	(NA)	(X)	3 405.7	(NA)	(X)	2 846.9
35199 03	Engine blocks, bare, machined, with no parts ----- millions -----	16	(S)	56.9	<sup>(9)</sup>	(X)	<sup>(9)</sup>
35199 04	Cylinder liners (sleeves) ----- do-----	13	(S)	78.6	<sup>(9)</sup>	(X)	<sup>(9)</sup>
35199 05	Cylinder heads ----- do-----	15	(S)	118.6	<sup>(9)</sup>	(X)	<sup>(9)</sup>
35199 06	Intake manifolds ----- do-----	6	(S)	7.9	<sup>(9)</sup>	(X)	<sup>(9)</sup>
35199 07	Exhaust manifolds ----- do-----	12	(S)	17.1	<sup>(9)</sup>	(X)	<sup>(9)</sup>
35199 08	Crankshafts, engine ----- millions -----	18	(S)	167.8	<sup>(9)</sup>	(X)	<sup>(9)</sup>
35199 09	Camshafts, engine ----- do-----	14	(S)	67.5	<sup>(9)</sup>	(X)	<sup>(9)</sup>
35199 14	Valve guides, seats, and tappets ----- do-----	14	(X)	13.0	<sup>(9)</sup>	(X)	<sup>(9)</sup>
35199 15	Rocker arms and parts ----- do-----	8	(X)	34.6	<sup>(9)</sup>	(X)	<sup>(9)</sup>

See footnotes at end of table.



**Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977—Con.**

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see Introductory text]

1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>	
			Quantity <sup>2</sup>	Value (million dollars)		Quantity <sup>2</sup>	Value (million dollars)
	<b>INTERNAL COMBUSTION ENGINES, N.E.C.—Con.</b>						
35199 —	Parts and accessories for internal combustion engines, except aircraft and gasoline automotive engines and gas turbines —Con.						
35199 16	Fuel injection systems, engine .....	19	(S)	589.7	9	(X)	745.2
35199 17	Governors, engine speed .....	7	(S)	64.1	8	(X)	57.3
35199 18	Radiators, stationary engine .....	9	(S)	31.8	5	(X)	
35199 19	Superchargers, including turbo-chargers .....	15	(S)	239.6	(9)	(X)	(9)
35199 21	Flywheels .....	7	(D)	(10)	(9)	(X)	(9)
35199 22	Timing chains .....	2	(D)	(10)	(9)	(X)	(9)
35199 23	Timing gears .....	4	(D)	(10)	(9)	(X)	(9)
	Engine bearings (halves):						
35199 24	Main .....	8	(S)	25.3	(9)	(X)	(9)
35199 25	Connecting rod .....	13	(S)	29.0	(9)	(X)	(9)
35199 26	Camshaft .....	4	(S)	3.5	(9)	(X)	(9)
	Oil pumps, new:						
35199 27	Engine .....	10	(S)	23.0	(9)	(X)	(9)
35199 28	Power steering .....	-	(D)	(10)	(9)	(X)	(9)
35199 29	Engine oil coolers .....	5	(S)	22.7	(9)	(X)	
35199 31	Fuel pump assemblies, excluding kits and rebuilds .....	6	(S)	22.9	(9)	(X)	
35199 32	Water pump assemblies, excluding kits and rebuilds .....	10	(S)	35.4	(9)	(X)	(9)
35199 98	Other parts and accessories .....	67	(S)	10802.1	92	(X)	92 025.8
35199 00	Parts and accessories for internal combustion engines, except aircraft and gasoline automotive engines and gas turbines, n.a.k. ....	(NA)	(X)	954.6	(NA)	(X)	18.7
35190 00	Internal combustion engines, n.e.c., n.a.k., typically for establishments with 20 employees or more (see note) .....	(NA)	(X)	31.4	(NA)	(X)	29.9
35190 02	Internal combustion engines, n.e.c., n.s.k., typically for establishments with less than 20 employees (see note) .....	(NA)	(X)	26.8	(NA)	(X)	23.0
	<b>FARM MACHINERY AND EQUIPMENT</b>						
3523— —	<b>Total .....</b>	<b>(NA)</b>	<b>(X)</b>	<b>10 370.0</b>	<b>(NA)</b>	<b>(X)</b>	<b>9 548.9</b>
35231 —	Wheel tractors and attachments (except contractors' off-highway type, garden tractors, turf tractors, and motor tillers):						
35231 00	Wheel tractors and attachments (except contractors' off-highway type, garden tractors, turf tractors, and motor tillers):						
	As reported in the census of manufactures .....	17	(X)	2 321.9	22	(X)	2 637.0
	As reported in the Current Industrial Report MA-35T, Tractors (Except Contractors Off-Highway Type, Garden Tractors, Turf Tractors, and Motor Tillers) .....	(NA)	(X)	2 319.9	(NA)	(X)	2 574.4
	Wheel tractors, farm type (power-take-off (PTO) hp):						
	2-wheel drive (including front wheel assist types):						
35231 01	Less than 80 PTO hp .....	(NA)	9 189	101.8	(NA)	50 827	368.9
35231 03	60 to 79 PTO hp .....	(NA)	6 343	940.0	(NA)	16 544	185.2
35231 05	80 to 99 PTO hp .....	(NA)	5 153	102.8	(NA)	20 104	292.6
35231 07	100 to 119 PTO hp .....	(NA)	7 139	219.1	(NA)	41 765	639.7
35231 09	120 to 139 PTO hp .....	(NA)	20 570	769.2	(NA)	18 593	362.9
35231 11	140 to 159 PTO hp .....	(NA)	3 653	136.3	(NA)	5 556	118.8
35231 13	160 to 179 PTO hp .....	(NA)	5 673	247.8	(NA)	3 520	64.1
35231 15	180 PTO hp or more .....	(NA)			(NA)		
	4-wheel drive (tractors with equal size tires, front and rear):						
35231 31	Less than 200 PTO hp .....	(NA)	2 164	134.8	(NA)	4 164	113.8
35231 33	200 to 249 PTO hp .....	(NA)	2 296	169.5	(NA)	4 879	154.3
35231 35	250 PTO hp or more .....	(NA)	2 798	240.2	(NA)	2 936	105.8
	Wheel tractors, nonfarm (industrial type) (excluding tractor chassis, shipped as a part of front engine mount, integral design tractor shovel loader/backhoes) (net engine (NEHP)):						
35231 56	Less than 50 NEHP .....	(NA)	1 715	21.8	(NA)	7 116	41.9
35231 58	50 to 59 NEHP .....	(NA)	2 566	37.0	(NA)	6 521	44.9
35231 60	60 to 69 NEHP .....	(NA)	(11)	(11)	(NA)		
35231 62	70 to 79 NEHP .....	(NA)	(11)	(11)	(NA)	3 626	28.7
35231 64	80 to 99 NEHP .....	(NA)			(NA)		
35231 66	100 NEHP or more .....	(NA)	111 042	1121.6	(NA)		
35231 87	Attachments for wheel tractors, farm type and nonfarm (industrial type) (excluding attachments for tractor chassis shipped as part of front engine design tractor shovel loader/backhoes) (NEHP) .....	(NA)	(X)	24.0	(NA)	(X)	34.8

See footnotes at end of table.



**Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977—Con.**

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>	
			Quantity <sup>2</sup>	Value (million dollars)		Quantity <sup>2</sup>	Value (million dollars)
	<b>FARM MACHINERY AND EQUIPMENT—Con.</b>						
35232 —	Farm dairy machines, sprayers and dusters, farm elevators, and farm blowers:						
35232 00	Farm dairy machines and equipment, sprayers and dusters (except aerial types), farm elevators, farm blowers, and attachments:						
	As reported in the census of manufactures .....	124	(X)	382.2	95	(X)	306.4
	As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment .....	(NA)	(X)	397.6	(NA)	(X)	315.4
	Farm dairy machines and equipment:						
	Mechanical installations:						
35232 03	Vacuum pumping outfits for milking machines with or without motors and/or tanks .....	(NA)	66 083	32.7	(NA)	10 704	8.1
35232 04	Milking machines, complete; suspended and floor type bucket, single and double units .....	(NA)			(NA)	2 216	.3
35232 08	Pipeline milking units, complete (including claws, shells, inflations, tubes, with or without pulsator) .....	(NA)			(NA)	58 926	17.6
35232 15	Other farm dairy machines and equipment .....	(NA)			(NA)		
35232 16	Attachments for farm dairy machines and equipment .....	(NA)	(NA)	44.7	(NA)	(X)	47.1
	Sprayers and dusters (except aerial types):						
	Power sprayers, field and row crop types only:						
35232 18	Self-propelled .....	(NA)	2 305	68.0	(NA)	2 941	34.6
	Tractor mounted:						
35232 20	Piston pump type, all types of mounted tank .....	(NA)	7 964	8.6	(NA)	5 614	3.5
35232 22	Nonpiston pump type:						
	Rear-mounted tank .....	(NA)	3 037	3.0	(NA)	6 597	3.0
35232 23	Other than rear-mounted tank .....	(NA)	7 588	4.9	(NA)	5 017	2.3
	Other than tractor mounted:						
	Piston pump type:						
	Power-take-off driven (gallons per minute (g.p.m.)):						
35232 24	More than 4 and less than 11 g.p.m. ....	(NA)	1 086	1.3	(NA)	1 138	1.2
35232 25	11 g.p.m. or more .....	(NA)	353	2.1	(NA)	655	1.6
	Engine driven:						
35232 26	More than 4 and less than 11 g.p.m. ....	(NA)	343	.6	(NA)	1 714	2.1
35232 27	11 g.p.m. or more .....	(NA)	98	.2	(NA)	742	1.8
35232 28	Nonpiston pump type .....	(NA)	1 954	1.8	(NA)	7 108	3.4
35232 29	Other power sprayers, more than 4 g.p.m. ....	(NA)	1 363	2.0	(NA)	2 141	1.6
	Power sprayers, other than row crop and field types (more than 4 gallons per minute):						
35232 31	Power-take-off driven .....	(NA)	1 765	3.6	(NA)	2 026	2.8
35232 32	Engine driven .....	(NA)	4 895	9.7	(NA)	3 357	3.6
	Air carried type power sprayers (field, row, crop, and orchard types):						
35232 33	Complete units .....	(NA)	5 742	11.5	(NA)	7 662	10.8
35232 34	Attachment type .....	(NA)					
	Foggers and mist sprayers, portable:						
35232 35	Foggers, thermal, less than 16 gallons/hour output .....	(NA)	110 357	10.4	(NA)	111 213	5.1
35232 36	Mist sprayers, less than 16 gallons/hour output (nonthermal) .....	(NA)					
	Hand pulled and garden type 4 g.p.m. or less:						
35232 37	16 gallon tank capacity or less .....	(NA)	1.7	.4	(NA)	4.1	.8
35232 38	Tank capacity more than 16 gallon .....	(NA)	2.2	1.0	(NA)	3.2	.8
	Sprayers, agricultural hand:						
35232 39	Less than 1 gallon .....	(NA)	1 029.6	2.1	(NA)	2 278.8	2.4
	1 gallon or more:						
35232 41	Compressed air or gas .....	(NA)	3 373.6	54.8	(NA)	2 719.8	31.6
35232 42	Knapsack (liquid pump) .....	(NA)	42.0	2.2	(NA)	28.7	1.2
35232 43	Hose-end and flame sprayers .....	(NA)	1 997.7	5.6	(NA)	1 184.6	2.7
35232 48	Sprayer pumps (bucket, barrel, slide, etc.) .....	(NA)			(NA)	49.1	.4
35232 52	Dusters, power, all types .....	(NA)	493	.4	(NA)	875	1.3
	Dusters, hand:						
35232 53	Crank or knapsack .....	(NA)	190 116	.8	(NA)	372 038	1.1
35232 54	Plunger .....	(NA)					
35232 55	Other .....	(NA)					
35232 56	All other sprayers .....	(NA)	(X)	11.0	(NA)	(X)	8.0
35232 57	Attachments for sprayers and dusters .....	(NA)	(X)	8.1	(NA)	(X)	2.6
	Farm elevators and blowers:						
	Farm elevators, portable:						
35232 60	Single chain .....	(NA)	3 307	2.1	(NA)	5 004	1.8
35232 63	Double chain .....	(NA)	2 998	4.5	(NA)	7 174	7.2
	Auger type:						
35232 84	Less than 6 inch diameter .....	(NA)	13 874	2.0	(NA)	40 668	4.8
35232 65	6 inch diameter .....	(NA)	7 891	4.4	(NA)	73 628	20.1
35232 66	More than 6 inch diameter .....	(NA)	18 354	25.4	(NA)	58 382	28.5
35232 73	Other farm elevators, including stationary .....	(NA)	97 680	29.2	(NA)	10 270	19.4
35232 74	Other farm blowers, including forage blowers, combination grain and forage blowers .....	(NA)	3 674	22.7	(NA)	10 348	15.3
35232 75	Attachments for farm elevators and blowers .....	(NA)	(X)	15.7	(NA)	(X)	14.9

See footnotes at end of table.



**Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977—Con.**

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>	
			Quantity <sup>2</sup>	Value (million dollars)		Quantity <sup>2</sup>	Value (million dollars)
	<b>FARM MACHINERY AND EQUIPMENT—Con.</b>						
35233 —	Planting, seeding, and fertilizing machinery, excluding turf machinery:						
35233 00	Planting, seeding, and fertilizing machinery, and attachments:						
	As reported in the census of manufactures .....	117	(X)	566.5	100	(X)	466.5
	As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment .....	(NA)	(X)	584.8	(NA)	(X)	479.4
	Corn planters, corn and cotton planters, and lister planters:						
	Pull type:						
35233 16	Less than 6 row .....	(NA)	22 309	39.8	}	(NA)	183 089
35233 18	6 row and larger .....	(NA)	(12)	(12)			
35233 22	Mounted planters, total rows mounted .....	(NA)	1285 085	12161.8			
35233 24	Grain drills (fixed frame), all types .....	(NA)	17 331	88.5			
35233 40	Transplanters, pull type or mounted, and broadcast seeders (end-gate mounted and drawn) .....	(NA)	21 308	7.7	(NA)	(D)	(13)
	Fertilizer distributors, pull type or mounted (excluding fertilizer attachments and lawn and garden hand type):						
35233 50	Dry (including lime spreaders):						
	Gravity distribution (5 ft or more) .....	(NA)	2 402	2.9	(NA)	2 898	3.6
	Centrifugal distribution:						
35233 55	Pull type .....	(NA)	2 263	10.0	(NA)	5 765	16.5
35233 56	Mounted .....	(NA)	2 492	12.6	(NA)	2 783	10.5
35233 52	Liquid .....	(NA)	5 952	15.2	(NA)	6 619	20.6
35233 54	Anhydrous ammonia .....	(NA)	3 104	9.6	(NA)	6 562	13.0
35233 57	Manure spreaders, conveyor type .....	(NA)	9 067	36.2	(NA)	16 688	33.4
35233 65	Manure spreaders, tank type, open and closed .....	(NA)	2 533	13.4	(NA)	7 853	23.0
35233 69	Manure pumps, liquid .....	(NA)	1 689	7.7	(NA)	1 093	2.6
	Front and rear mounted loaders (farm type), manure and general utility:						
35233 71	Front-end mounted .....	(NA)	}	30.0	(NA)	27 861	41.4
35233 72	Rear-end mounted .....	(NA)			(NA)		
35233 77	Row crop unit planters (quantity in rows) .....	(NA)			(NA)		
35233 79	Other planting, seeding, and fertilizing machinery .....	(NA)	(X)	70.4	(NA)	(X)	13107.9
35233 84	Attachments for planting, seeding, and fertilizing machinery .....	(NA)	(X)	56.1	(NA)	(X)	45.0
35234 —	Harrows, rollers, pulverizers, stalk cutters, and similar equipment:						
35234 00	Harrows, rollers, pulverizers, stalk cutters and similar equipment and attachments (secondary tillage equipment):						
	As reported in the census of manufactures .....	86	(X)	298.7	95	(X)	392.2
	As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment .....	(NA)	(X)	303.0	(NA)	(X)	406.4
35234 03	Spike-tooth harrow sections and spring-tooth and tine-tooth harrow sections .....	(NA)	}	15.6	}	(NA)	103 260
35234 05	Power harrows .....	(NA)					
	Disc harrows:						
35234 13	Single (2-gang) .....	(NA)	574	1.0	(NA)	3 110	1.0
	Tandem:						
35234 14	Pull type .....	(NA)	13 934	89.8	(NA)	53 104	167.1
35234 09	Mounted .....	(NA)	8 484	5.6	(NA)	29 221	12.1
35234 23	Offset, all .....	(NA)	4 456	38.0	(NA)	11 215	39.2
35234 15	Combination tillage equipment (roller/harrows, disc or coulters/field cultivators, disc or coulters/spring-tooth) .....	(NA)	3 325	14.5	(NA)	8 619	17.4
	Stalk shredders and cutters or rotary mowers (PTO):						
35234 16	Flail type (without spout):						
	Less than 90 in. cutting width .....	(NA)	10 225	8.1	(NA)	10 139	4.4
35234 17	90 in. cutting width or more .....	(NA)	1 226	4.7	(NA)	2 270	5.3
	Horizontal blade type:						
35234 18	66 in. cutting width or less .....	(NA)	49 806	30.6	(NA)	53 245	25.4
35234 19	More than 66 in. up to 100 in. cutting width .....	(NA)	13 645	17.0	(NA)	20 018	16.5
35234 20	More than 100 in. cutting width .....	(NA)	4 982	21.6	(NA)	6 690	16.3
	Blade terracer or scrapers (farm size):						
35234 29	Rear mounted blade type .....	(NA)	26 873	10.2	(NA)	69 867	9.5
35234 21	Other (including wheel type) .....	(NA)	6 778	7.1	(NA)	24 031	13.6
35234 24	Land levelers .....	(NA)	4 089	8.4	(NA)	5 389	10.8
35234 26	Other harrows, rollers, pulverizers, and similar equipment .....	(NA)	20 982	22.6	(NA)	1480 808	1438.5
35234 27	Attachments for harrows, rollers, pulverizers, stalk cutters, and similar equipment .....	(NA)	(X)	8.2	(NA)	(X)	16.8
35235 —	Harvesting machinery:						
35235 00	Harvesting machinery and attachments:						
	As reported in the census of manufactures .....	88	(X)	1 854.1	85	(X)	1 463.3
	As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment .....	(NA)	(X)	1 811.3	(NA)	(X)	1 428.4
	Combines (harvester-threshers), grain types only:						
35235 13	Self-propelled .....	(NA)	}	1 199.6	}	(NA)	31 943
35235 15	Pull type .....	(NA)					
35235 21	Small grain header for combines, all sizes .....	(NA)	24 656	129.3	(NA)	45 892	95.8
35235 31	Corn heads, all sizes .....	(NA)	7 228	82.9	(NA)	24 035	126.8
35235 32	Windrowers or swathers (pull type for grain) .....	(NA)	}	7.3	}	(NA)	601
35235 42	Corn pickers .....	(NA)					
35235 53	Potato harvesters .....	(NA)	342	8.7	(NA)	1 005	14.1
35235 56	Beet harvesters, all row sizes .....	(NA)	244	4.2	(NA)	556	5.8
35235 57	Peanut diggers, shakers, and windrowers .....	(NA)	}	7.2	}	(NA)	2 517
35235 59	Peanut combines .....	(NA)					

See footnotes at end of table.



**Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977—Con.**

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1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>	
			Quantity <sup>2</sup>	Value (million dollars)		Quantity <sup>2</sup>	Value (million dollars)
	<b>FARM MACHINERY AND EQUIPMENT—Con.</b>						
35235 — 35235 00	Harvesting machinery—Con. Harvesting machinery and attachments—Con. As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment — Con.						
35235 63	Field forage harvesters: Shear bar, self-propelled type and pull type (basic machines) ..... number..	(NA)	5 318	60.1	(NA)	14 573	78.9
35235 64	Attachments for shear bar type: Pickup hay unit and cutter bar hay unit ..... do..	(NA)	8 189	11.3	(NA)	9 126	9.1
35235 65	Row crop unit, all sizes ..... do..	(NA)	5 707	18.4	(NA)	14 687	23.3
35235 70	Flail type (horizontal knives or vertical free-swinging knives or hammers), including discharge spouts ..... do..	(NA)	1 049	4.1	(NA)	4 167	9.2
35235 78	Cotton strippers and pickers (all types) ..... do..	(NA)			(NA)	1 816	24.5
35235 79	Other harvesting machinery (including cane harvesting equipment, potato diggers, picker-shellers, and field shelling attachments for corn pickers) ..... do..	(NA)	5 031	160.4	(NA)	<sup>15</sup> 11 801	<sup>15</sup> 191.3
35235 83	Attachments for harvesting machinery (including platform and seeder, reel, straw spreaders, load levelers, weed stripper, grate unit, knife grinders, and stalk walkers ..... do..	(NA)	(X)	97.7	(NA)	(X)	111.1
35236 — 35236 00	Haying machinery: Haying machinery and attachments: As reported in the census of manufactures ..... 31	31	(X)	444.8	38	(X)	414.9
35236 13	As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment ..... (NA)	(NA)	(X)	438.0	(NA)	(X)	405.0
35236 19	Mowers, cutter bar type (excluding combination mower- conditioners), all types ..... number..	(NA)	8 550	9.8	(NA)	13 962	7.7
35236 21	Mower-conditioners and windrowers with conditioner, auger and draper type: Pull type ..... do..	(NA)	15 975	105.8	(NA)	33 520	156.3
35236 31	Self-propelled ..... do..	(NA)	4 076	56.5	(NA)		
35236 53	Rakes, side delivery, cylinder type, and finger wheel type ..... do..	(NA)	10 089	19.5	(NA)	20 328	19.0
35236 57	Hay balers: Bales less than 200 lb ..... do..	(NA)	10 130	87.5	(NA)	24 876	82.8
35236 59	Bales more than 200 lb ..... do..	(NA)	14 302	117.2	(NA)	17 745	81.7
35236 64	Hay stackers ..... do..	(NA)	3 722	19.8	(NA)	1 037	7.8
35236 65	Bale throwing attachments for hay balers ..... do..	(NA)	2 929	1.7	(NA)	7 237	5.1
35236 82	Hay bale loaders (field type) ..... do..	(NA)			(NA)	4 136	2.8
35236 83	Other haying machinery ..... do..	(NA)			(NA)		
35237 — 35237 00	Other attachments for haying machinery (stripper, bale chute, and knife attachments) ..... do..	(NA)	106 788	40.5	(NA)	135 334	42.1
35237 32	Plows and listers, excluding turf and grounds machinery: Plows and listers (including plowshares) and attachments (primary tillage equipment): As reported in the census of manufactures ..... 55	55	(X)	125.9	56	(X)	199.0
35237 37	As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment ..... (NA)	(NA)	(X)	129.7	(NA)	(X)	207.8
35237 42	Moldboard plows: Pull type, 1-way ..... number..	(NA)	998	9.3	(NA)	4 438	18.2
35237 44	Mounted, 1-way ..... do..	(NA)	3 081	2.2	(NA)	15 771	7.7
35237 47	Semimounted, 1-way: 3-bottom and 4-bottom ..... do..	(NA)	809	3.9	(NA)	7 442	18.0
35237 48	5-bottom ..... do..	(NA)	( <sup>16</sup> )	( <sup>16</sup> )	(NA)	9 984	28.2
35237 49	6-bottom and 7-bottom ..... do..	(NA)	( <sup>16</sup> )	( <sup>16</sup> )	(NA)		
35237 51	8-bottom or more ..... do..	(NA)	<sup>16</sup> 1 388	<sup>16</sup> 9.8	(NA)	4 868	17.5
35237 55	Pull type and mounted, 2-way (1-bottom, 2-bottom, 3-bottom or more) ..... do..	(NA)	2 262	7.0	(NA)	2 822	8.4
35237 56	Disc plows, 1-way, 2-way (harrow plows, cylinder plows, Great Plains plows, Wheatland plows, etc.), all sizes ..... do..	(NA)	3 010	8.2	(NA)	817	2.1
35237 59	Subsoilers (deep tillage), wideshank ..... do..	(NA)			(NA)	8 129	10.0
35237 60	Terracing and ditching plows ..... do..	(NA)	1 039	1.4	(NA)	2 261	1.5
35237 61	Chisel plows, deep tillage (chisel or sweep type): Pull type ..... do..	(NA)	4 910	25.8	(NA)	15 084	36.2
35237 62	Mounted ..... do..	(NA)	4 018	8.8	(NA)	15 194	18.8
35237 63	Disc-chisel combination ..... do..	(NA)	4 105	19.8	(NA)	1 795	5.0
35237 64	Other plows, except snow plows ..... do..	(NA)	382	1.5	(NA)		
35237 65	Middlebushers and disc bedders (excluding planting attachments) ..... do..	(NA)	5 120	3.2	(NA)	5 912	7.5
35237 66	Attachments for plows (coulters, jointers, root cutters, sub-soilers, fertilizer distributors, etc.) (excluding lister planting attachments) ..... do..	(NA)	(X)	15.4	(NA)	(X)	15.5
35237 67	Plowshares ..... 1,000 lb..	(NA)	18 916	15.8	(NA)	33 973	19.4

See footnotes at end of table.



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1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>	
			Quantity <sup>2</sup>	Value (million dollars)		Quantity <sup>2</sup>	Value (million dollars)
	<b>FARM MACHINERY AND EQUIPMENT—Con.</b>						
35238 —	All other farm machinery and equipment, excluding turf and grounds equipment:						
35238 00	All other farm machinery and equipment (excluding parts), including cultivators, weeders, feed grinders and crushers; poultry, hog, and barnyard equipment; farm wagons; self-propelled irrigation systems, etc., except commercial turf equipment:						
	As reported in the census of manufactures .....	343	(X)	1 156.3	327	(X)	1 228.0
	As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment .....	(NA)	(X)	1 093.1	(NA)	(X)	1 271.7
	Cultivators and weeders—secondary tillage:						
	Corn- and cotton-type cultivators (shank and sweep type):						
	Mounted:						
35238 01	Front mounted .....	(NA)	2 667	2.0	(NA)	( <sup>17</sup> )	( <sup>17</sup> )
	Rear mounted:						
35238 02	Less than 4-row .....	(NA)			(NA)	7 728	1.7
35238 03	4-row and 5-row .....	(NA)	2 332	4.1	(NA)	10 802	11.1
35238 04	6-row and 7-row .....	(NA)	3 246	7.0	(NA)	10 102	15.2
35238 05	8-row or more .....	(NA)	6 377	27.1	(NA)	5 367	13.3
	Rotary cultivators:						
	Ground driven:						
35238 08	Rotary hoe sections .....	(NA)	( <sup>18</sup> )	( <sup>18</sup> )	(NA)	16 219	20.5
35238 09	Rotary hoe machines .....	(NA)	( <sup>18</sup> )	( <sup>18</sup> )			
	Integrally mounted (3-point hitch type cultivator):						
35238 10	Less than 4-row .....	(NA)	<sup>18</sup> 6 669	<sup>18</sup> 17.4	(NA)	8 637	16.4
35238 11	4-row and 5-row .....	(NA)	1 142	2.5			
35238 12	6-row and 7-row .....	(NA)	996	3.5	(NA)	672	1.6
35238 13	8-row or more .....	(NA)	( <sup>19</sup> )	( <sup>19</sup> )			
35238 14	Power driven .....	(NA)	<sup>19</sup> 1 179	<sup>19</sup> 5.0	(NA)		
	Field cultivators:						
	Pull type:						
35238 16	Folding type .....	(NA)	5 588	36.5	(NA)	11 624	35.4
35238 17	Nonfolding type .....	(NA)	905	3.7	(NA)	5 846	11.1
35238 18	Mounted .....	(NA)	2 024	3.9	(NA)	8 992	12.5
35238 19	Tool bars (basic units only), pull type or mounted .....	(NA)	3 446	5.4	(NA)	8 639	4.6
35238 23	Other cultivators and weeders .....	(NA)	24 347	15.4	(NA)	<sup>17</sup> 46 372	<sup>17</sup> 20.8
35238 22	Attachments for cultivators and weeders (front mounting frame, disc weeders, section, and drawbars) .....	(NA)	(X)	18.0	(NA)	(X)	17.9
	Machines for preparing crops for market or for use:						
	Feed grinders and crushers, power:						
35238 24	Hammer mills, with hammers only (farm size) .....	(NA)	532	1.4	(NA)	1 330	.9
35238 30	Burr mills, with grinding plates only, combination roughage mills, and roller mills (farm size) .....	(NA)	3 674	7.5	(NA)	5 178	4.4
35238 27	Feed mixers (farm size), stationary and portable .....	(NA)	2 293	17.3	(NA)	2 885	17.2
	Combination grinder-mixers:						
35238 26	Stationary .....	(NA)	4 653	27.4	(NA)	12 393	42.0
35238 28	Portable .....	(NA)			(NA)		
35238 33	Tobacco curers .....	(NA)	914	2.2	(NA)	4 315	11.1
	Driers (grain, hay, and seed):						
	Heated air crop driers:						
	Batch type:						
35238 34	Power-take-off operated .....	(NA)	514	3.5	(NA)	1 609	7.2
35238 35	Electric motor operated .....	(NA)	3 833	6.7	(NA)	8 764	15.1
35238 36	Continuous flow type .....	(NA)	835	22.4	(NA)	4 362	50.7
35238 43	Heated air units .....	(NA)	22 178	18.2	(NA)	26 692	19.5
	Crop drying fans only (more than 15,000 c.f.m. at approximately 1 in. pressure):						
35238 37	24 in. or less diameter .....	(NA)	31 538	15.6	(NA)	43 637	10.3
35238 38	More than 24 in. diameter .....	(NA)	5 725	6.0	(NA)	2 031	1.9
35238 40	Other machines for preparing crops for market or for use .....	(NA)	171 094	114.1	(NA)	152 510	106.2
35238 41	Attachments for machines for preparing crops for market or for use .....	(NA)	(X)	21.3	(NA)	(X)	10.4
	Farm poultry equipment:						
	Incubators (quantity represents egg capacity in thousands):						
35238 45	Chicken egg incubators .....	(NA)	17 341	7.0	(NA)	55 075	12.2
35238 46	All other incubators for all types of eggs except chicken, including turkey regardless of capacity .....	(NA)	264	.3	(NA)	1 900	.8
	Brooders, floor and hanging:						
35238 48	Gas (5000 btu or more open flame, infrared and catalytic) .....	(NA)	41 566	2.0	(NA)	81 248	3.0
35238 49	Other (electric, oil, coal, wood) .....	(NA)			(NA)		
35238 51	Brooders, battery (starting and growing) (quantity in number of decks) .....	(NA)	3 940	.3	(NA)	6 698	.2
	Nests and cages:						
35238 52	Hole and colony type (total linear footage) .....	(NA)	330.9	1.2	(NA)	1 606.8	3.6
35238 53	Standard laying cages (total linear footage) .....	(NA)			(NA)		
35238 54	Laying cages mechanized for feeding and/or egg gathering .....	(NA)	2 221.9	11.3	(NA)	5 114.9	17.1
	Poultry feeders (except turkey feeders):						
35238 55	Trough (except mechanical) (total linear footage) .....	(NA)	(S)	12.9	(NA)	4 757.8	2.9
35238 56	Hanging .....	(NA)			(NA)	212.9	.6
35238 57	Mechanical (total linear footage of conveyor):						
	Floor type .....	(NA)	3 630.9	6.1	(NA)	7 465.4	14.8
35238 59	Cage type .....	(NA)			(NA)	26 795.5	15.7

See footnotes at end of table.



**Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977—Con.**

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>	
			Quantity <sup>2</sup>	Value (million dollars)		Quantity <sup>2</sup>	Value (million dollars)
	<b>FARM MACHINERY AND EQUIPMENT—Con.</b>						
35238 —	All other farm machinery and equipment, excluding turf and grounds equipment—Con.						
35238 00	All other farm machinery and equipment (excluding parts), including cultivators, weeders, feed grinders and crushers; poultry, hog, and barnyard equipment; farm wagons; self-propelled irrigation systems, etc., except commercial turf equipment—Con. As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment—Con. Farm poultry equipment—Con.						
	Poultry waterers (except turkey waterers):						
35238 62	Trough (chicken type) and automatic fountains ——— thousands..	(NA)	1 266.4	3.0	(NA)	782.1	3.3
35238 63	All other waterers ——— do..	(NA)	6 093.8	5.3	(NA)	9 443.3	5.1
35238 64	Turkey waterers ——— do..	(NA)	17.2	.1	(NA)	76.5	.2
35238 66	Egg washers ——— number..	(NA)	322	5.0	(NA)	380	4.2
35238 65	Egg graders, mechanized ——— thousands..	(NA)	2 433.0	35.7	(NA)	(X)	34.0
35238 69	Other farm poultry equipment ——— do..	(NA)	(X)	6.4	(NA)	(X)	2.9
35238 68	Attachments for farm poultry equipment ——— do..	(NA)			(NA)		
	Hog equipment:						
	Feeding equipment:						
35238 A1	Wet or dry power units ——— number..	(NA)	6 204	.8	(NA)	7 445	1.3
35238 A3	Pig feeders, less than 100 lb, live weight ——— do..	(NA)	188 877	3.5	(NA)	416 046	3.1
	Hog feeders, more than 100 lb, live weight:						
35238 A5	4 or less feed openings (except rotary) ——— do..	(NA)	35 245	1.4	(NA)	69 066	2.4
35238 A7	More than 4 feed openings (except rotary) ——— do..	(NA)	52 284	10.2	(NA)	110 913	12.9
35238 A9	All rotary feeders, no doors, or trough dividers ——— do..	(NA)	12 840	1.3	(NA)	38 326	2.9
	Handling equipment:						
35238 B1	Hog ferrowing crate end stall ——— do..	(NA)	45 817	4.3	(NA)	78 834	6.8
35238 B3	Hog pens (quantity in number of feet) ——— feet..	(NA)	235 583	2.4	(NA)	285 782	2.1
	Watering equipment:						
35238 B5	Hog waterer, heated (pressure type) ——— number..	(NA)	35 549	3.8	(NA)	52 328	3.3
35238 B7	Hog waterer, not heated (pressure and gravity type) ——— do..	(NA)	329 472	2.5	(NA)	597 750	3.9
35238 B9	Gravity storage hog waterers (moveable), 20 gallons or more capacity ——— do..	(NA)	13 968	1.2	(NA)	21 425	1.3
35238 C5	Other hog equipment ——— do..	(NA)	154 797	6.5	(NA)	33 628.8	11.3
35238 C9	Attachments for hog equipment ——— do..	(NA)	(X)	.8	(NA)	(X)	1.6
	Other barn and barnyard equipment:						
	Cattle and dairy barn equipment:						
	Feeding equipment:						
	Silo unloaders, forego end grain:						
35238 71	Tower (including sealed storage unloaders):						
	Top discharge ——— number..	(NA)	7 596	26.4	(NA)	21 045	34.9
35238 72	Bottom discharge with chain conveyor ——— do..	(NA)	2 806	21.9	(NA)	4 854	18.0
35238 73	Bottom discharge with euger conveyor ——— do..	(NA)	7 322	13.4	(NA)	11 394	14.3
35238 75	Electric powered bunk feeders ——— do..	(NA)	4 313	1.1	(NA)	6 364	1.1
35238 76	Calf feeder, hopper type ——— do..	(NA)	14 866	3.1	(NA)	8 817	2.3
35238 77	Cattle feeder, hopper type ——— do..	(NA)	2 571	.5	(NA)	9 424	1.2
35238 86	Liquid feeder tanks, self feeder type ——— do..	(NA)			(NA)		
	Handling equipment:						
35238 70	Dairy barn gutter cleaners ——— do..	(NA)	5 988	21.0	(NA)	9 445	24.7
35238 78	Dairy cattle stall for use with stanchions ——— do..	(NA)	20 318	1.8	(NA)	32 877	1.7
35238 79	Chain tie stalls (all types) ——— do..	(NA)	44 878	2.7	(NA)	49 039	2.2
35238 80	Dairy free stalls, new (for loose housing barns) ——— do..	(NA)	54 112	1.9	(NA)	77 447	1.8
35238 82	Pens (quantity in number of feet) ——— feet..	(NA)	289 845	2.8	(NA)	205 129	1.4
35238 83	Milking parlor stalls (tandem, abreast-type) ——— number..	(NA)	28 195	9.3	(NA)	17 854	4.9
35238 84	Stanchions, swing type (shipped separately and with stalls) ——— do..	(NA)	43 005	1.2	(NA)	83 331	1.2
	Water equipment:						
35238 85	Combination cattle and hog waterer, heated (pressure type) ——— do..	(NA)	17 166	2.0	(NA)	21 924	2.4
35238 81	Cattle waterer, heated (pressure type) ——— do..	(NA)	29 853	4.7	(NA)	29 965	3.3
35238 87	Dairy cattle water bowls, inside ——— do..	(NA)	216 810	3.3	(NA)	220 001	2.4
35238 88	Stock watering tanks ——— do..	(NA)	168 602	10.2	(NA)	216 998	10.9
35238 89	Livestock water heaters ——— do..	(NA)	40 637	1.2	(NA)	61 880	1.9
35238 61	Windmill heads and windmill towers ——— do..	(NA)	3 996	1.1	(NA)		
35238 91	Other barn and barnyard equipment (excluding construction items such as partition doors, windows, pillars, etc.) ——— do..	(NA)	724 270	44.1	(NA)	(X)	35.6
35238 92	Attachments for other barn and barnyard equipment ——— do..	(NA)	(X)	1.5	(NA)	(X)	2.0
	Self-propelled irrigation systems:						
35238 93	Center-pivot system (quantity in ten-tower equivalents) ——— ten-tower equiv..	(NA)	7 219	207.4	(NA)	11 601	259.7
35238 95	All other systems using 100-foot flexible hose feeder line or more ——— number..	(NA)	5 075	34.0	(NA)	6 989	39.6
	Farm wagons and other farm transportation equipment:						
	Wagons (chassis only) and trailer gears (excluding motor trucks):						
	4-wheel:						
35238 D1	Less than 4-ton capacity ——— do..	(NA)	24 880	20.7	(NA)	12 372	4.6
35238 D2	4-ton capacity or more ——— do..	(NA)			(NA)	45 459	19.0
	Boxes and racks for mounting on wagons and trailer gears:						
35238 D3	Manual unloading or dump ——— do..	(NA)	9 675	8.2	(NA)	16 437	10.9
35238 D4	Gravity unloading (grain type only) ——— do..	(NA)	9 361	6.8	(NA)	28 714	14.4
	Power unloading:						
35238 D5	Grain type (cannot handle forage) ——— do..	(NA)	2 277	11.3	(NA)	2 541	6.6
35238 D6	Forage type ——— do..	(NA)	7 033	21.1	(NA)	18 594	30.1

See footnotes at end of table.



Table 6a. **Product and Product Classes—Quantity and Value of Shipments by All Producers:**  
**1982 and 1977—Con.**

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see Introductory text]

1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>	
			Quantity <sup>2</sup>	Value (million dollars)		Quantity <sup>2</sup>	Value (million dollars)
	<b>FARM MACHINERY AND EQUIPMENT—Con.</b>						
35238 —	All other farm machinery and equipment, excluding turf and grounds equipment—Con.						
35238 00	All other farm machinery and equipment (excluding parts), including cultivators, weeders, feed grinders and crushers; poultry, hog, and barnyard equipment; farm wagons; self-propelled irrigation systems, etc., except commercial turf equipment—Con.						
	As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment—Con.						
35238 D7	Farm wagons and other farm transportation equipment—Con.						
	Boxes with integral running gear, grain and forage types ----- number-----	(NA)	3 385	14.0	(NA)	6 097	13.3
35238 D8	Other farm transportation equipment ----- do-----	(NA)	9 344	34.1	(NA)	1 184.7	44.4
35238 D9	Attachments for farm transportation equipment ----- do-----	(NA)	(X)	10.0	(NA)	(X)	8.9
35239 —	Parts for farm machinery, for sale separately, excluding commercial turf and grounds equipment -----	(NA)	(X)	2 327.6	(NA)	(X)	1 609.5
	Parts sold to plants producing farm equipment (original equipment):						
35239 21	Parts for wheel tractors -----	29	(X)	702.8	29	(X)	291.5
35239 01	Parts for cultivators and weeders -----	9	(X)	7.3	15	(X)	15.8
35239 02	Parts for harrows, rollers, pulverizers, stalk cutters, and similar equipment (secondary tillage) -----	18	(X)	17.4	20	(X)	35.9
35239 03	Parts for planting, seeding, and fertilizing machinery -----	26	(X)	81.3	25	(X)	56.7
35239 04	Parts for haying machinery -----	9	(X)	19.7	13	(X)	20.7
35239 05	Parts for harvesting machinery -----	26	(X)	180.0	26	(X)	93.5
35239 06	Parts for farm poultry equipment -----	4	(X)	2.1	7	(X)	9.1
35239 07	Parts for farm dairy machinery and equipment -----	5	(X)	4.3	2	(X)	(20)
35239 08	Parts for hog and other barn and barnyard machinery -----	7	(X)	18.3	7	(X)	15.7
35239 09	Parts for machines for preparing crops for market or for use -----	11	(X)	11.9	8	(X)	12.2
35239 11	Parts for sprayers and dusters -----	18	(X)	30.5	19	(X)	17.9
35239 12	Parts for plows, except plowshares -----	8	(X)	9.4	(X)	(X)	(20)
35239 19	Parts for other farm machinery (excluding wheel tractors) -----	37	(X)	144.2	39	(X)	2010.5
35239 25	Parts for farm machinery for replacement and repair: Parts for wheel tractors: -----	9	(X)	253.5	17	(X)	308.8
	As reported in the census of manufactures -----						
	As reported in the Current Industrial Report MA-35T, Tractors (Except Contractors' Off-Highway Type, Garden Tractors, Turf Tractors, and Motor Tillers) -----	(NA)	(X)	247.0	(NA)	(X)	310.4
35239 30	Parts, except for wheel tractors: -----	160	(X)	725.0	145	(X)	507.9
	As reported in the census of manufactures -----						
	As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment -----	(NA)	(X)	735.2	(NA)	(X)	535.9
35239 89	Parts for farm wagons and other farm transportation equipment -----	(NA)	(X)	4.8	(NA)	(X)	7.5
35239 71	Parts for planting, seeding, and fertilizing machinery -----	(NA)	(X)	88.3	(NA)	(X)	71.4
35239 95	Parts for harrows, rollers, pulverizers, and similar equipment -----	(NA)	(X)	37.8	(NA)	(X)	2159.6
35239 77	Parts for stalk shredders and cutters or rotary movers (PTO) -----	(NA)	(X)	19.9	(NA)	(X)	(21)
35239 93	Parts for plows, except plowshares -----	(NA)	(X)	22.2	(NA)	(X)	31.4
35239 94	Parts for harvesting machinery -----	(NA)	(X)	258.3	(NA)	(X)	171.3
35239 96	Parts for haying machinery -----	(NA)	(X)	107.1	(NA)	(X)	64.7
35239 41	Parts for farm dairy machines and equipment -----	(NA)	(X)	33.3	(NA)	(X)	24.2
35239 52	Parts for sprayers and dusters -----	(NA)	(X)	43.7	(NA)	(X)	31.4
35239 97	Parts for farm elevators and for grain and forage blowers -----	(NA)	(X)	8.4	(NA)	(X)	2.8
35239 80	Parts for cultivators and weeders -----	(NA)	(X)	50.7	(NA)	(X)	30.6
35239 82	Parts for machines for preparing crops for market or for use -----	(NA)	(X)	18.8	(NA)	(X)	12.1
35239 81	Parts for farm poultry equipment -----	(NA)	(X)	13.7	(NA)	(X)	7.1
35239 87	Parts for other barn and barnyard equipment -----	(NA)	(X)	27.2	(NA)	(X)	20.3
35239 72	Parts for hog equipment -----	(NA)	(X)	3.4	(NA)	(X)	1.6
35239 50	Operator cabs for farm equipment: Produced by complete farm machinery manufacturers: -----	9	(X)	41.1	2218	(S)	2284.9
	As reported in the census of manufactures -----						
	As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment -----	(NA)	(X)	42.1	(NA)	(X)	24.3
35239 83	Farm tractors ----- number-----	(NA)	19 874	37.0	(NA)	8 766	10.0
35239 85	All other, including windrowers, combines, power sprayers, etc. ----- do-----	(NA)	4 739	5.1	(NA)	9 025	14.3
35239 51	Produced by other than complete farm machinery manufacturers ----- do-----	5	(X)	38.9	(22)	(22)	(22)
35239 00	Parts for farm machinery, for sale separately, excluding commercial turf and grounds equipment -----	(NA)	(X)	81.9	(NA)	(X)	37.8
3523A —	Commercial turf and grounds mowing equipment: Commercial turf and grounds mowing equipment, including parts and attachments: -----	38	(X)	203.0	(NA)	(X)	107.4
3523A 00	As reported in the census of manufactures -----						
	As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment -----	(NA)	(X)	199.2	(NA)	(X)	(23)
3523A 01	Powered nonriding mowers ----- number-----	(NA)	41 573	19.7	11	69 369	15.7
3523A 03	Riding reel-type turf mowers (except greens mowers) ----- do-----	(NA)	8 372	35.8	3	(24)	(24)
3523A 05	Greens mowers, all types ----- do-----	(NA)			4	*4 611	11.5

See footnotes at end of table.



**Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977—Con.**

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>	
			Quantity <sup>2</sup>	Value (million dollars)		Quantity <sup>2</sup>	Value (million dollars)
	<b>FARM MACHINERY AND EQUIPMENT—Con.</b>						
3523A — 3523A 00	Commercial turf and grounds mowing equipment—Con. Commercial turf and grounds mowing equipment, including parts and attachments—Con. As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment— Con.						
3523A 07	Riding rotary turf mowers ----- number..	(NA)	16 178	57.1	10	14 051	27.5
3523A 15	Gang rotary cutting units, reel and rotary (individual sections) ----- do..	(NA)	11 049	14.7	4	29 045	7.7
3523A 17	Flail mower cutting units, including gang ----- do..	(NA)	2 912	5.0	2	248 444	2411.3
3523A 19	Other mowing equipment ----- do..	(NA)	6 321	5.2	5	(X)	9.8
3523A 31	Parts and attachments for commercial turf and grounds mowing equipment ----- do..	(NA)	(X)	61.7	14	(X)	24.0
3523B — 3523B 00	Other commercial turf and grounds care equipment: Other commercial turf and grounds care equipment, including parts and attachments, except mowing equipment: As reported in the census of manufactures ----- As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment -----	15	(X)	35.2	(NA)	(X)	172.9
3523B 01	Turf tractors ----- number..	(NA)	(X)	38.4	(NA)	(X)	(23)
3523B 06	Sod cutters and sod harvesters ----- do..	(NA)	(26)	(26)	4	(26)	(26)
3523B 08	Seeders, spreaders, and top dresser attachments ----- do..	(NA)	(26)	(26)	2	(27)	(27)
3523B 11	Aerators, spikers, and pluggers ----- do..	(NA)	(26)	(26)	5	(S)	2.7
3523B 13	Dethatchers ----- do..	(NA)	268 036	2617.7	3	(S)	2.2
			2 255	1.1	2	(27)	(27)
3523B 15	Power brooms, blowers, vacuums, and sweepers ----- do..	(NA)	4 353	6.1	6	(S)	5.6
3523B 21	Irrigation systems (except agricultural and residential) ----- do..	(NA)	(26)	(26)	2	(S)	273.1
3523B 25	Other commercial turf and grounds care equipment ----- do..	(NA)	2 518	7.9	11	(X)	25147.7
3523B 31	Parts and accessories for other commercial turf and grounds care equipment (except mowing equipment) ----- do..	(NA)	(X)	5.8	11	(X)	11.6
35230 00	Farm machinery and equipment, n.s.k., typically for establishments with 20 employees or more (see note) -----	(NA)	(X)	233.1	(NA)	(X)	241.0
35230 02	Farm machinery and equipment, n.s.k., typically for establishments with less than 20 employees (see note) -----	(NA)	(X)	420.6	(NA)	(X)	310.8
	<b>LAWN AND GARDEN EQUIPMENT</b>						
3524- — 35241 — 35241 00	<b>Total</b> ----- Consumer nonriding lawn, garden, and snow equipment: Consumer nonriding lawn, garden, and snow equipment: As reported in the census of manufactures ----- As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment -----	(NA)	(X)	2 385.2	(NA)	(X)	1 747.2
	Lawnmowers:	63	(X)	1 167.5	(NA)	(X)	841.2
	As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment -----	(NA)	(X)	1 142.8	(NA)	(X)	(28)
35241 01	Reel, push type, nonpowered ----- thousands..	(NA)	124.1	2.0	4	121.5	3.1
35241 02	Reel, push type, gasoline engine powered ----- do..	(NA)	25.9	8.2	7	35.7	6.0
35241 11	Rotary, push type, gasoline engine powered ----- do..	(NA)	3 200.5	377.3	30	3 080.5	249.7
35241 12	Rotary, self-propelled, gasoline engine powered ----- do..	(NA)			21	996.0	132.1
35241 15	Electric, all types, including battery powered ----- do..	(NA)	1 489.4	266.3	4	157.5	15.7
35241 20	Rotary garden (motor) tillers ----- do..	(NA)	544.1	188.8	27	28499.0	29115.0
35241 30	Two-wheel tractors, walking type (except rotary tillers) ----- do..	(NA)	11.8	8.8	3	(30)	(30)
	Snow throwers (snow blower) (except attachment type):						
35241 41	Single stage ----- do..	(NA)	150.1	22.1	9	244.2	37.9
35241 42	Dual stage ----- do..	(NA)	88.7	48.1	13	146.1	50.9
	Powered lawn edgers/trimmers:						
35241 51	Fixed blade, gas ----- do..	(NA)	186.1	22.6	8		
35241 52	Fixed blade, electric ----- do..	(NA)	440.1	16.7	2	2 208.4	57.6
35241 53	Other than fixed blades ----- do..	(NA)	2 958.2	111.8	9	6 023.4	112.9
35241 61	Shredders and shredder-grinders ----- do..	(NA)	19.6	5.0	7	16.1	3.4
35241 62	Powered hedge trimmers ----- do..	(NA)	(31)	(31)	1	(S)	3020.6
35241 63	Yard vacuums and blowers ----- do..	(NA)	543.4	23.8	13	39.8	11.6
35241 64	Lawn sweepers, push type and powered (except attachment type) ----- do..	(NA)	94.5	8.0	4	89.5	5.0
35241 91	Other consumer nonriding lawn, garden, and snow equipment ----- do..	(NA)	311 216.3	3133.4	11	(X)	19.8
35243 — 35243 00	Parts and attachments for consumer nonriding lawn, garden, and snow equipment: Parts and attachments for consumer nonriding lawn, garden, and snow equipment: As reported in the census of manufactures ----- As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment -----	40	(X)	148.4	(NA)	(X)	103.2
35243 01	Parts -----	(NA)	(X)	140.9	(NA)	(X)	(28)
35243 11	Attachments ----- thousands..	(NA)	1 107.4	22.9	36	(X)	70.6
					19	(X)	32.6
35244 — 35244 00	Consumer riding lawn, garden, and snow equipment: Consumer riding lawn, garden, and snow equipment: As reported in the census of manufactures ----- As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment <sup>33</sup> -----	19	(X)	765.2	(NA)	(X)	577.4
	Lawn tractors and riding mowers:	(NA)	(X)	742.4	(NA)	(X)	(28)
	Front engine:						
35244 03	Less than 8.0 hp ----- thousands..	(NA)	(34)	(34)			
35244 04	8.0 hp to 9.9 hp ----- do..	(NA)	34139.8	3482.8	21	460.4	194.9
35244 07	10.0 hp or more ----- do..	(NA)	252.2	255.3			

See footnotes at end of table.



**Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1982 and 1977—Con.**

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see Introductory text]

1982 product code	Product	1982			1977		
		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>	
			Quantity <sup>2</sup>	Value (million dollars)		Quantity <sup>2</sup>	Value (million dollars)
	<b>LAWN AND GARDEN EQUIPMENT—Con.</b>						
35244 — 35244 00	Consumer riding lawn, garden, and snow equipment—Con. Consumer riding lawn, garden, and snow equipment—Con. As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment <sup>33</sup> — Con. Lawn tractors and riding mowers—Con. Rear engine:						
35244 05	Less than 6.0 hp ----- thousands..	(NA)	22.9	12.8	14	119.3	43.8
35244 12	6.0 hp to 7.9 hp ----- do..	(NA)	24.5	14.2	14	140.3	64.8
35244 08	8.0 hp to 9.9 hp ----- do..	(NA)	134.3	98.9			
35244 09	10.0 hp or more ----- do..	(NA)	58.3	51.9			
35244 11	Garden tractors:						
35244 13	Less than 10.0 hp ----- do..	(NA)	25.6	45.3	6	13.1	12.1
35244 15	10.0 hp to 13.9 hp ----- do..	(NA)			16	70.0	88.5
35244 17	14.0 hp to 15.9 hp ----- do..	(NA)			13	33.1	51.8
35244 19	16.0 hp to 19.9 hp ----- do..	(NA)	( <sup>35</sup> )	( <sup>35</sup> )	15	68.6	105.7
35244 31	20.0 hp or more ----- do..	(NA)	( <sup>35</sup> )	( <sup>35</sup> )	1	*107.1	15.7
	Other consumer riding lawn, garden, and snow equipment ----- do..	(NA)	<sup>35</sup> 66.4	<sup>35</sup> 144.2	3		
35245 — 35245 00	Parts and attachments for consumer riding lawn, garden, and snow equipment: Parts and attachments for consumer riding lawn, garden, and snow equipment: As reported in the census of manufactures ----- As reported in the Current Industrial Report MA-35A, Farm Machinery and Lawn and Garden Equipment -----	38	(X)	250.9	(NA)	(X)	199.3
35245 01	Parts -----	(NA)	(X)	222.1	(NA)	(X)	( <sup>28</sup> )
	Attachments:	(NA)	(X)	<sup>32</sup> 119.7	39	(X)	127.1
35245 11	Rotary mower decks ----- thousands..	(NA)	129.9	43.9	11	105.5	25.0
35245 12	Rotary tiller attachments ----- do..	(NA)	16.9	9.3	12	*30.5	9.4
35245 13	Blades, dozer ----- do..	(NA)	23.9	3.1	11	50.7	5.8
35245 14	Snow throwers ----- do..	(NA)	23.1	7.5	11	19.7	5.3
35245 15	Carts and wagons ----- do..	(NA)	37.4	3.9	7	*25.8	3.0
35245 19	All other attachments ----- do..	(NA)	(X)	34.5	19	(X)	23.6
35240 00	Lawn and garden equipment, n.s.k., typically for establishments with 20 employees or more (see nota) -----	(NA)	(X)	18.9	(NA)	(X)	17.0
35240 02	Lawn and garden equipment, n.s.k., typically for establishments with less than 20 employees (see nota) -----	(NA)	(X)	34.4	(NA)	(X)	9.1

Note: In 1982 Census of Manufactures, data for establishments of small single-unit companies with up to 20 employees were estimated from administrative-record data rather than data actually collected from respondents. Employment cutoff used for administrative records for each industry and shipments figures are included in code ending with "002". In both 1982 and 1977 Censuses of Manufactures, products not completely identified on standard forms were coded in appropriate product class (five-digit) followed by "00" or to appropriate product group code (four-digit) followed by "000".

<sup>1</sup>Data reported by all producers, not just those with shipments of \$100,000 or more.

<sup>2</sup>For some establishments, data have been estimated from central unit values which are based on quantity-value relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: \* 10 to 19 percent estimated; \*\* 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).

<sup>3</sup>For 1982, data for product codes 35112 03, 35112 61, and 35112 71 are combined to avoid disclosing data for individual companies.

<sup>4</sup>For 1977, data for product codes 35112 01 and 35112 09 were combined to avoid disclosing data for individual companies.

<sup>5</sup>Includes basic engines (short block engines), primarily automotive type, shipped for conversion to marine or other nonautomotive uses. In 1977, 434,221 gasoline engines were shipped for conversion (from CIR MA-35L). 1977 data on nonautomotive diesel engines shipped for conversion were withheld to avoid disclosing data for individual companies. Comparable data are not available for 1982.

<sup>6</sup>For 1977, product code 35194 11 was combined with product code 35194 12 to avoid disclosing data for individual companies.

<sup>7</sup>For 1982, product code 35195 00 is combined with product code 35197 21 to avoid disclosing data for individual companies.

<sup>8</sup>For 1977, product code 35195 00 was combined with product codes 35197 21, 35197 51, and 35197 00 to avoid disclosing data for individual companies.

<sup>9</sup>For 1977, data were included with product code 35199 98.

<sup>10</sup>For 1982, product codes 35199 21, 35199 22, 35199 23, and 35199 28 are combined with product code 35199 98 to avoid disclosing data for individual companies.

<sup>11</sup>For 1982, product codes 35231 60, 35231 62, and 35231 66 are combined to avoid disclosing data for individual companies.

<sup>12</sup>For 1982, product codes 35233 18 and 35233 22 are combined to avoid disclosing data for individual companies.

<sup>13</sup>For 1977, product code 35233 24 was included with product code 35233 79.

<sup>14</sup>For 1977, product code 35234 05 was included with product code 35234 26.

<sup>15</sup>For 1977, product code 35235 42 was included with product code 35235 79 to avoid disclosing data for individual companies.

<sup>16</sup>For 1982, product codes 35237 44, 35237 47, and 35237 48 are combined to avoid disclosing data for individual companies.

<sup>17</sup>For 1977, product code 35238 01 was included with product code 35238 23 to avoid disclosing data for individual companies.

<sup>18</sup>For 1982, product codes 35238 08, 35238 09, and 35238 10 are combined to avoid disclosing data for individual companies.

<sup>19</sup>For 1982, product codes 35238 13 and 35238 14 are combined to avoid disclosing data for individual companies.

<sup>20</sup>For 1977, product code 35239 07 and 35239 12 were included with product code 35239 19.

<sup>21</sup>For 1977, product code 35239 77 was included with product code 35239 95.

<sup>22</sup>For 1977, product code 35239 51 was included with product code 35239 50 as reported in the census of manufactures.

<sup>23</sup>For 1977, data for commercial turf and grounds equipment were collected only in the census of manufactures.

<sup>24</sup>For 1977, product code 3523A 03 was included with product code 3523A 17 to avoid disclosing data for individual companies.

<sup>25</sup>For 1977, product code 3523B 01 was included with product code 3523B 25 to avoid disclosing data for individual companies.

<sup>26</sup>For 1982, product codes 3523B 01, 3523B 06, 3523B 08, 3523B 11, and 3523B 21 are combined to avoid disclosing data for individual companies.

<sup>27</sup>For 1977, product codes 3523B 06 and 3523B 13 were included with product code 3523B 21 to avoid disclosing data for individual companies.

<sup>28</sup>For 1977, data were collected only in the census of manufactures.

<sup>29</sup>Comparable data for 1977 from CIR MA-35A for rotary garden (motor) tillers are 425,495 units valued at \$65.8 million for under six engine horsepower and 110,899 units valued at \$53.1 million for six engine horsepower or more.

<sup>30</sup>For 1977, product codes 35241 30 and 35241 62 were combined to avoid disclosing data for individual companies. Comparable data for 1977 from CIR MA-35A for two-wheel, walking-type tractors has been combined with attachments for garden tractors.

<sup>31</sup>For 1982, product codes 35241 62 and 35241 91 are combined to avoid disclosing data for individual companies.

<sup>32</sup>Only replacement parts are collected on the current industrial report. This is assumed to be the major reason for lower total values for 35243 00 and 35245 00 than those shown for census data.

<sup>33</sup>See 1978 CIR MA-35A for more product detail.

<sup>34</sup>For 1982, product codes 35244 03 and 35244 04 are combined to avoid disclosing data for individual companies.

<sup>35</sup>For 1982, product codes 35244 17, 35244 19, and 35244 31 are combined to avoid disclosing data for individual companies.



**Table 6b. Product Classes—Value of Shipments by All Producers for Specified States: 1982 and 1977**

[Million dollars. Product classes covered are those that are economically significant and whose production is geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by type" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1982. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Product class and geographic area	1982 value of product shipments	1977 value of product shipments	Product class and geographic area	1982 value of product shipments	1977 value of product shipments
<b>35112, STEAM, GAS, AND HYDRAULIC TURBINES AND PARTS</b>			<b>35236, HAYING MACHINERY</b>		
United States .....	2 846.9	1 415.4	United States .....	444.8	414.9
Connecticut .....	76.3	(GG)	Wisconsin .....	7.0	7.8
Michigan .....	8.0	(AA)			
<b>35191, GASOLINE AND GAS-GASOLINE ENGINES</b>			<b>35237, PLOWS AND LISTERS</b>		
United States .....	1 001.8	892.9	United States .....	125.9	199.0
Michigan .....	83.7		California .....	2.8	(NA)
Wisconsin .....	859.1	741.2	Illinois .....	45.5	(GG)
			Kansas .....	12.8	10.3
<b>35193, DIESEL, SEMIDIESEL, AND DUAL FUEL ENGINES, NONAUTOMOTIVE</b>			Texas .....	3.6	6.0
United States .....	1 548.2	1 587.4	<b>35238, ALL OTHER FARM MACHINERY AND EQUIPMENT</b>		
Illinois .....	636.8	769.7	United States .....	1 156.0	1 228.3
<b>35199, PARTS FOR INTERNAL COMBUSTION ENGINES</b>			Arkansas .....	7.1	(AA)
United States .....	3 405.7	2 846.9	California .....	62.6	70.4
California .....	173.5	104.4	Colorado .....	22.9	24.8
Connecticut .....	198.1	(GG)	Georgia .....	43.8	30.9
Illinois .....	481.2	509.4	Idaho .....	14.6	(CC)
Indiana .....	478.1	487.5	Illinois .....	103.7	124.1
Iowa .....	141.5	86.7	Indiana .....	70.4	57.2
Michigan .....	566.1	490.5	Iowa .....	167.1	177.4
New York .....	110.8	91.7	Kansas .....	38.0	48.2
Ohio .....	175.0	182.1	Louisiana .....	4.3	(AA)
Oklahoma .....	39.8	23.8	Minnesota .....	20.9	49.9
Pennsylvania .....	59.9	54.5	Missouri .....	35.3	(FF)
South Carolina .....	66.7	(GG)	Nebraska .....	250.1	206.5
Texas .....	38.7	13.9	New York .....	5.6	2.4
Wisconsin .....	517.0	443.9	North Carolina .....	13.0	24.3
<b>35232, DAIRY EQUIPMENT, SPRAYERS, ELEVATORS, AND BLOWERS</b>			North Dakota .....	15.9	15.9
United States .....	382.2	306.4	Ohio .....	31.8	33.6
California .....	8.7	(NA)	Oklahoma .....	9.4	(EE)
Georgia .....	2.4	2.2	Oregon .....	13.1	20.4
Illinois .....	70.1	69.0	Pennsylvania .....	21.7	29.8
Indiana .....	5.4	10.5	South Dakota .....	6.5	13.1
Iowa .....	41.3	33.2	Tennessee .....	5.5	(AA)
Kansas .....	28.1	30.5	Texas .....	26.6	25.0
Michigan .....	26.0	15.4	Virginia .....	12.4	(CC)
Minnesota .....	58.1	(FF)	Washington .....	6.1	20.5
Missouri .....	3.7	(BB)	Wisconsin .....	107.9	117.5
Nebraska .....	21.5	20.4			
New York .....	28.4	(EE)	<b>35239, PARTS FOR FARM MACHINERY</b>		
North Dakota .....	10.1	5.5	United States .....	2 327.6	1 609.5
Ohio .....	2.7	7.3	California .....	26.4	19.1
Texas .....	5.1	3.0	Colorado .....	14.9	15.7
Wisconsin .....	41.8	33.4	Florida .....	10.2	(NA)
<b>35233, PLANTING, SEEDING, AND FERTILIZING MACHINERY</b>			Georgia .....	17.1	11.8
United States .....	566.5	466.5	Idaho .....	5.6	(BB)
Georgia .....	12.1	(BB)	Illinois .....	480.0	439.6
Indiana .....	35.7	35.4	Indiana .....	56.9	63.6
Iowa .....	124.1	75.1	Kansas .....	62.6	32.9
Kansas .....	38.0	20.8	Louisiana .....	3.7	2.6
Michigan .....	5.2	(NA)	Michigan .....	30.5	107.7
Minnesota .....	28.8	28.9	Minnesota .....	36.5	35.1
Nebraska .....	8.9	11.3	Mississippi .....	2.5	6.3
North Dakota .....	7.5	(EE)	Missouri .....	42.4	34.4
Ohio .....	10.5	(FF)	Nebraska .....	55.7	39.7
Wisconsin .....	13.0	9.1	New York .....	16.0	18.1
<b>35234, HARROWS, ROLLERS, PULVERIZERS, STALK CUTTERS</b>			North Carolina .....	3.2	7.4
United States .....	296.7	392.2	North Dakota .....	21.5	15.2
California .....	5.5	12.0	Ohio .....	42.7	37.0
Indiana .....	20.4	(FF)	Pennsylvania .....	60.5	55.4
Iowa .....	14.1	28.8	South Dakota .....	2.7	2.2
Kansas .....	45.4	45.2	Texas .....	16.3	11.6
Minnesota .....	5.1	8.5	Virginia .....	2.2	(NA)
Mississippi .....	9.5	14.5	Washington .....	10.0	(NA)
North Dakota .....	9.2	(CC)	Wisconsin .....	177.2	120.0
Texas .....	23.5	20.9			
Wisconsin .....	11.0	(EE)	<b>3523A, COMMERCIAL TURF AND GROUNDS MOWING EQUIPMENT</b>		
<b>35235, HARVESTING MACHINERY, EXCEPT FOR HAY AND STRAW</b>			United States .....	203.0	107.4
United States .....	1 854.1	1 463.3	Illinois .....	9.7	13.0
California .....	38.9	20.2	Kansas .....	18.9	8.2
Kansas .....	14.8	(EE)	Wisconsin .....	100.6	(FF)
Minnesota .....	5.8	8.4			
North Dakota .....	10.2	(NA)	<b>35241, CONSUMER NONRIDING LAWN AND GARDEN EQUIPMENT</b>		
Wisconsin .....	17.2	(FF)	United States .....	1 167.5	841.2
			California .....	50.0	45.3
			Florida .....	3.1	2.2
			Illinois .....	122.0	83.4
			Indiana .....	19.2	12.2
			Mississippi .....	131.9	95.4
			Tennessee .....	85.6	(NA)
			Wisconsin .....	107.7	67.2

See footnotes at end of table.



Table 6b. Product Classes—Value of Shipments by All Producers for Specified States: 1982 and 1977—Con.

[Million dollars. Product classes covered are those that are economically significant and whose production is geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by type" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1982. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Product class and geographic area	1982 value of product shipments	1977 value of product shipments	Product class and geographic area	1982 value of product shipments	1977 value of product shipments
<b>35243, PARTS FOR CONSUMER NONRIDING LAWN AND GARDEN EQUIPMENT</b>			<b>35244, CONSUMER RIDING LAWN AND GARDEN EQUIPMENT—Con.</b>		
United States -----	148.4	103.2	Wisconsin -----	308.7	177.0
Missouri -----	7.6	9.1			
Wisconsin -----	7.8	4.5	<b>35245, PARTS FOR CONSUMER RIDING LAWN AND GARDEN EQUIPMENT</b>		
			United States -----	250.9	199.3
<b>35244, CONSUMER RIDING LAWN AND GARDEN EQUIPMENT</b>			Indiana -----	20.2	26.8
United States -----	765.2	577.4	Kansas -----	4.4	(BB)
			Ohio -----	14.7	16.8
			Wisconsin -----	94.6	71.4

Note: For 1977, the following value ranges (in million dollars) substitute for actual figures withheld to avoid disclosing data for individual companies: AA—less than \$2.0 but not 0; BB—\$2.0 to \$4.9; CC—\$5.0 to \$9.9; EE—\$10.0 to \$19.9; FF—\$20.0 to \$49.9; GG—\$50.0 or more.

Table 6c. Product Classes—Value Shipped by All Producers: 1982 and Earlier Years

[Million dollars. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

1982 product code	Product class	1982	1981 <sup>1</sup>	1980 <sup>1</sup>	1979 <sup>1</sup>	1978 <sup>1</sup>	1977	1972	1967
3511-	<b>Turbines and turbine generator sets</b> -----	3 662.3	3 786.7	3 600.7	3 211.2	2 823.8	2 813.1	2 079.7	1 059.3
35111	Steam, gas, and hydraulic turbine generator sets -----	786.5	1 790.8	1 877.2	1 623.2	1 445.3	1 389.2	1 521.6	714.5
35112	Steam, gas, and hydraulic turbines and parts -----	2 846.9	1 974.9	1 683.3	1 556.4	1 354.6	1 415.4	541.5	344.7
35110	Turbines and turbine generator sets, n.s.k. -----	28.9	21.0	40.2	31.7	(S)	28.5	16.6	-
3519-	<b>Internal combustion engines, n.e.c.</b> -----	8 972.4	10 909.0	9 555.1	9 623.5	9 064.1	7 548.0	3 353.4	2 187.6
35191	Gasoline and gas-gasoline engines -----	1 001.8	1 030.2	1 107.4	1 212.7	1 034.5	892.9	490.8	386.9
35193	Diesel, semidiesel, and dual fuel engines, nonautomotive -----	1 548.2	2 533.8	2 152.5	1 712.4	1 976.9	1 587.4	604.0	447.9
35194	Diesel, semidiesel, and dual fuel engines, automotive -----	1 715.6	2 115.5	1 829.9	1 649.9	1 382.5	1 322.2	634.6	233.2
35195	Outboard motors -----	(2)	(2)	(2)	(2)	(D)	(2)	(2)	(2)
35196	Gas engines, except gas turbines -----	99.6	132.7	94.7	56.6	35.3	31.9	35.2	22.6
35197	Tank and converted internal combustion engines -----	<sup>21</sup> 143.4	<sup>29</sup> 96.0	<sup>27</sup> 07.0	<sup>28</sup> 92.6	(D)	<sup>28</sup> 13.7	<sup>24</sup> 25.9	<sup>22</sup> 67.1
35199	Parts for internal combustion engines -----	3 405.7	4 070.0	3 632.8	4 058.4	3 623.4	2 846.9	1 144.9	816.0
35190	Internal combustion engines, n.s.k. -----	58.2	30.8	30.8	40.9	(S)	52.9	18.0	13.9
3523-	<b>Farm machinery and equipment</b> -----	10 370.0	13 038.4	11 852.9	12 038.1	9 880.3	9 548.9	4 143.5	(NA)
35231	Wheel tractors and attachments -----	2 321.9	3 251.1	2 919.2	3 093.8	2 523.7	2 637.0	1 215.2	1 040.2
35232	Dairy equipment, sprayers, elevators, and blowers -----	382.2	458.5	468.5	465.4	350.7	306.4	<sup>31</sup> 57.8	(NA)
35233	Planting, seeding, and fertilizing machinery -----	566.5	689.5	617.5	594.4	417.6	466.5	172.0	183.0
35234	Harrows, rollers, pulverizers, stalk cutters -----	298.7	461.2	504.9	529.1	386.7	392.2	191.8	(4)
35235	Harvesting machinery, except for hay and straw -----	1 854.1	2 340.5	1 997.4	1 924.3	1 583.6	1 463.3	580.4	580.7
35236	Haying machinery -----	444.8	655.0	704.2	592.8	465.0	414.9	184.1	148.8
35237	Plows and listers -----	125.9	193.3	207.9	230.1	173.9	199.0	85.4	<sup>42</sup> 81.1
35238	All other farm machinery and equipment -----	1 156.3	1 526.8	1 539.3	1 683.8	1 278.7	1 228.0	<sup>56</sup> 10.8	458.0
35239	Parts for farm machinery -----	2 327.6	2 601.7	2 005.1	1 995.9	1 724.2	1 609.5	741.4	565.0
3523A	Commercial turf and grounds mowing equipment -----	203.0	186.7	161.3	151.2	134.0	107.4	(NA)	(NA)
3523B	Other commercial turf and grounds care equipment -----	35.2	44.4	47.4	148.1	111.6	172.9	(NA)	(NA)
35230	Farm machinery and equipment, n.s.k. -----	653.7	629.6	680.2	629.2	(S)	551.8	<sup>52</sup> 04.6	156.6
3524-	<b>Lawn and garden equipment<sup>7</sup></b> -----	2 385.2	2 270.4	2 419.2	2 703.8	2 118.0	1 747.2	1 143.4	(NA)
35241	Consumer nonriding lawn and garden equipment -----	1 167.5	1 083.1	1 240.1	1 403.2	1 136.2	841.2	(NA)	(NA)
35243	Parts for consumer nonriding lawn and garden equipment -----	148.4	170.2	129.2	136.2	121.6	103.2	(NA)	(NA)
35244	Consumer riding lawn and garden equipment -----	765.2	729.9	767.0	845.5	606.1	577.4	(NA)	(NA)
35245	Parts for consumer riding lawn and garden equipment -----	250.9	259.6	250.5	280.2	249.7	199.3	(NA)	(NA)
35240	Lawn and garden equipment, n.s.k. -----	53.3	27.6	32.4	38.7	(S)	26.1	2.5	(NA)

<sup>1</sup>Figures are estimates derived from a representative sample of manufacturing establishments canvassed in annual survey of manufactures and, therefore, may differ from results that would be obtained from a complete canvass of all manufacturing establishments. Standard errors associated with estimates are published in annual survey of manufactures volumes for this period.

<sup>2</sup>Product class 35195 is combined with product class 35197 to avoid disclosing data for individual companies.

<sup>3</sup>Individual product codes included in product class for 1972 differ significantly from codes for prior years. Products shifting into or out of product class represent more than 15 percent of total U.S. value shipped.

<sup>4</sup>For 1967, product class 35234 was combined with product class 35237 to avoid disclosing data for individual companies.

<sup>5</sup>Individual product codes included in product class for 1972 differ from the codes for 1967. Products shifting into or out of this product class represent approximately 12 percent of total 1967 shipments.

<sup>6</sup>For 1972, product class 35230 included data not specified by kind for industry 3524.

<sup>7</sup>Product class structure of industry changed significantly between 1978 and 1977; 1977 data are not comparable with data for prior years. Industry 3524 was created for 1972 (being formerly a part of industry 3522); thus, no comparable data prior to 1972 exist.



**Table 7. Materials Consumed by Kind: 1982 and 1977**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 material code	Material	1982		1977	
		Quantity <sup>1</sup>	Delivered cost (million dollars)	Quantity <sup>1</sup>	Delivered cost (million dollars)
INDUSTRY 3511, TURBINES AND TURBINE GENERATOR SETS					
	Materials, parts, containers, and supplies -----	(X)	1 266.1	(X)	1 111.4
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons..	27.3	15.9	(S)	18.4
331012	Sheet and strip ----- do..	(S)	1.0	(S)	5.5
331013	Plates ----- do..	(S)	56.9	195.1	90.1
331053	All other carbon steel mill shapes and forms ----- do..	(S)			
	Alloy steel, except stainless:				
331021	Bars and bar shapes ----- do..	(S)	48.6	(S)	21.8
331029	All other alloy steel mill shapes and forms ----- do..	(S)		*19.4	29.8
	Stainless steel:				
331033	Sheet and strip ----- do..	(S)	4.3		
331050	All other stainless steel mill shapes and forms ----- do..	14.1	38.6	(S)	40.8
	Copper and copper-base alloy mill shapes and forms:				
335728	Bare wire for electrical conduction ----- million lb..	(D)	(D)		
335792	Insulated wire and cable, except magnet wire (quantity of copper content) ----- do..	(D)	(D)		
335102	Rod, bar, and mechanical wire, including extruded and/or drawn shapes ----- do..	(D)	(D)	(S)	57.7
335143	Plate, sheet, and strip, including military cups and discs ----- do..	(D)	(D)		
335152	Pipe and tube ----- do..	(D)	(D)		
335001	Aluminum and aluminum-base alloy mill shapes and forms ----- do..	(D)	(D)	**1.4	1.7
	Castings (rough and semifinished):				
332011	Iron (gray and malleable):				
	Purchased ----- 1,000 s tons..	(S)	21.7	*16.2	29.6
	Produced and consumed ----- do..	-	(X)	(S)	(X)
332045	Steel:				
	Purchased ----- do..	(S)	59.3	27.0	52.9
	Produced and consumed ----- do..	(D)	(X)	(S)	(X)
336100	Aluminum and aluminum-base alloy:				
	Purchased ----- million lb..	(S)	1.9	(D)	(*)
	Produced and consumed ----- do..	-	(X)	-	(X)
336200	Copper and copper-base alloy:				
	Purchased ----- do..	(S)	2.2	(S)	*5.6
	Produced and consumed ----- do..	-	(X)	(S)	(X)
336902	Other nonferrous:				
	Purchased ----- do..	(S)	5.3	(X)	(*)
	Produced and consumed ----- do..	-	(X)	(X)	(X)
346200	Iron and steel forgings:				
	Purchased ----- 1,000 s tons..	(S)	234.1	(D)	(D)
	Produced and consumed ----- do..	(D)	(X)	(S)	(X)
359225	Pistons, piston rings, carburetors, valves (intake and exhaust only) -----	(X)	(D)	(X)	(D)
362120	Integral horsepower electric motors and generators (1 hp or more):				
	Purchased ----- thousands..	(D)	(D)	(S)	12.5
	Produced and consumed ----- do..	(Z)	(X)	(S)	(X)
369401	Engine electrical equipment, including spark plugs, magnetos, generators, starters, etc. -----	(X)	(D)	(X)	(D)
	Bearings:				
356218	Ball -----	(X)	7.3	(X)	(D)
356201	Roller -----	(X)	.6	(X)	(D)
356810	Plain bearings and bushings -----	(X)	7.6	(X)	5.7
356601	Speed changers, drives, gears, and industrial high speed drives -----	(X)	16.7	(X)	10.8
344001	Fabricated structural metal products -----	(X)	35.3	(X)	(D)
344301	Metal tanks, heat exchangers, steam condensers, and other boiler products, fabricated steel plate and weldments -----	(X)	15.6	(X)	30.4
345001	Bolts, nuts, screws, rivets, and screw machine products -----	(X)	12.1	(X)	9.1
346901	Metal stampings -----	(X)	.3	(X)	(D)
354501	Cutting tools for machine tools -----	(X)	12.2	(X)	12.7
356120	Hydraulic fluid power pumps, motors, and related hydraulic equipment ----- thousands..	(S)	10.0	2.1	4.5
356301	Air and gas compressors, except refrigeration compressors ----- do..	(D)	(D)	(D)	(D)
304101	Rubber and plastics hose and belting -----	(X)	.3	(X)	(*)
329300	Gaskets, all types, and asbestos packing -----	(X)	1.6	(X)	(*)
307902	Fabricated plastics products (except gaskets) -----	(X)	(D)	(X)	(*)
265001	Paperboard containers and boxes ----- 1,000 s tons..	(S)	1.5	(X)	(*)
351903	Parts and attachments for internal combustion engines, except gasoline automotive and aircraft -----	-	-	(X)	(*)
970099	All other materials and components, parts, containers, and supplies consumed -----	(X)	449.2	(X)	*345.3
971000	Materials, parts, containers, and supplies, n.s.k. <sup>2</sup> -----	(X)	84.4	(X)	(D)
INDUSTRY 3519, INTERNAL COMBUSTION ENGINES, N.E.C.					
	Materials, parts, containers, and supplies -----	(X)	4 598.4	(X)	*4 150.8
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons..	*106.1	59.3	66.9	36.0
331012	Sheet and strip ----- do..	**56.3	33.6	100.9	41.6
331013	Plates ----- do..	(S)	9.6	*39.5	14.3
331053	All other carbon steel mill shapes and forms ----- do..	(S)	15.0	(S)	12.4

See footnotes at end of table.



Table 7. **Materials Consumed by Kind: 1982 and 1977—Con.**

(Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text)

1982 material code	Material	1982		1977	
		Quantity <sup>1</sup>	Delivered cost (million dollars)	Quantity <sup>1</sup>	Delivered cost (million dollars)
INDUSTRY 3519, INTERNAL COMBUSTION ENGINES, N.E.C.—Con.					
Mill shapes and forms, except castings and forgings—Con.					
Alloy steel, except stainless:					
331021	Bars and bar shapes ..... 1,000 s tons..	*44.0	39.5	19.9	12.5
331029	All other alloy steel mill shapes and forms ..... do..	(S)	8.3	(S)	.9
Stainless steel:					
331033	Sheet and strip ..... do..	(S)	24.5	(S)	4.4
331050	All other stainless steel mill shapes and forms ..... do..	(S)		*3.3	6.4
Copper and copper-base alloy mill shapes and forms:					
335728	Bare wire for electrical conduction ..... million lb..	(S)	9.8	(S)	12.6
335792	Insulated wire and cable, except magnet wire (quantity of copper content) ..... do..	(S)		(S)	
335102	Rod, bar, and mechanical wire, including extruded and/or drawn shapes ..... do..	(S)	2.2	16.4	13.5
335143	Plate, sheet, and strip, including military cups and discs ..... do..	3.2	4.0		
335152	Pipe and tube ..... do..	(S)	7.0	(S)	6.0
335001	Aluminum and aluminum-base alloy mill shapes and forms ..... do..	(S)	9.2	*3.8	3.5
Castings (rough and semifinished):					
332011	Iron (gray and malleable):				
	Purchased ..... 1,000 s tons..	(S)	743.7	567.6	547.7
	Produced and consumed ..... do..	(D)	(X)	(S)	(X)
332045	Steel:				
	Purchased ..... do..	(S)	48.7	13.0	40.4
	Produced and consumed ..... do..	-	(X)	(S)	(X)
336100	Aluminum and aluminum-base alloy:				
	Purchased ..... million lb..	(S)	258.7	239.6	237.3
	Produced and consumed ..... do..	(D)	(X)	(S)	(X)
336200	Copper and copper-base alloy:				
	Purchased ..... do..	(S)	5.2	*8.3	8.7
	Produced and consumed ..... do..	(D)	(X)	(S)	(X)
336902	Other nonferrous:				
	Purchased ..... do..	(S)	13.1	(X)	(*)
	Produced and consumed ..... do..	-	(X)	(X)	(X)
346200	Iron and steel forgings:				
	Purchased ..... 1,000 s tons..	(S)	379.8	*135.3	188.6
	Produced and consumed ..... do..	(D)	(X)	(S)	(X)
359225	Pistons, piston rings, carburetors, valves (intake and exhaust only) ..... do..	(X)	293.4	(X)	170.7
362120	Integral horsepower electric motors and generators (1 hp or more):				
	Purchased ..... thousands..	(D)	(*)	(D)	(D)
	Produced and consumed ..... do..	(X)	(X)	(S)	(X)
369401	Engine electrical equipment, including spark plugs, magnetos, generators, starters, etc. .... do..	(X)	174.4	(X)	166.8
Bearings:					
356218	Ball ..... do..	(X)	21.4	(X)	23.9
356201	Roller ..... do..	(X)	22.5	(X)	20.0
356810	Plain bearings and bushings ..... do..	(X)	43.5	(X)	36.9
356601	Speed changers, drives, gears, and industrial high speed drives ..... do..	(X)	78.3	(X)	82.9
344001	Fabricated structural metal products ..... do..	(X)	32.4	(X)	9.4
344301	Metal tanks, heat exchangers, steam condensers, and other boiler products, fabricated steel plate, and weldments ..... do..	(X)	56.0	(X)	35.6
345001	Bolts, nuts, screws, rivets, and screw machine products ..... do..	(X)	77.9	(X)	87.1
346901	Metal stampings ..... do..	(X)	55.7	(X)	48.4
354501	Cutting tools for machine tools ..... do..	(X)	50.4	(X)	52.0
356120	Hydraulic fluid power pumps, motors, and related hydraulic equipment ..... thousands..	(S)	36.0	(S)	8.9
356301	Air and gas compressors, except refrigeration compressors ..... do..	(S)	48.4	(S)	28.4
304101	Rubber and plastics hose and belting ..... do..	(X)	39.4	(X)	(*)
329300	Gaskets, all types, and asbestos packing ..... do..	(X)	72.3	(X)	(*)
307902	Fabricated plastics products (except gaskets) ..... do..	(X)	13.3	(X)	(*)
265001	Paperboard containers and boxes ..... 1,000 s tons..	(S)	13.5	(X)	(*)
351903	Parts and attachments for internal combustion engines, except gasoline, automotive, and aircraft ..... do..	(X)	422.6	(X)	(*)
970099	All other materials and components, parts, containers, and supplies consumed ..... do..	(X)	*1 136.6	(X)	*1 860.3
971000	Materials, parts, containers, and supplies, n.s.k. <sup>2</sup> ..... do..	(X)	245.2	(X)	85.8
INDUSTRY 3523, FARM MACHINERY AND EQUIPMENT					
Materials, parts, containers, and supplies ..... do..					
		(X)	4 860.2	(X)	5 030.4
Mill shapes and forms, except castings and forgings:					
Carbon steel:					
331011	Bars and bar shapes ..... 1,000 s tons..	*326.8	171.2	560.1	220.6
331012	Sheet and strip ..... do..	*518.6	255.6	968.6	311.1
331013	Plates ..... do..	*115.2	63.4	249.5	89.1
331015	Structural shapes ..... do..	*81.4	39.4	*177.9	62.7
331017	Wire and wire products ..... do..	(S)	8.5	*32.1	18.6
331019	All other carbon steel mill shapes and forms ..... do..	*185.7	89.1	*237.4	103.8
Alloy steel, except stainless:					
331021	Bars and bar shapes ..... do..	*30.6	21.1	*56.3	25.5
331029	All other alloy steel mill shapes and forms ..... do..	(S)	0.5	(S)	9.5
Stainless steel mill shapes and forms:					
331033	Sheet and strip ..... do..	(S)	7.0	(S)	15.8
331050	All other stainless steel mill shapes and forms ..... do..	(S)	2.6	(S)	2.1
Copper and copper-base alloy:					
335102	Rod, bar, and mechanical wire, including extruded and/or drawn shapes ..... million lb..	(S)	2.0	(S)	5.0
335143	Plate, sheet, and strip, including military cups and discs ..... do..	(S)	.9	.1	.2
335152	Pipe and tube ..... do..	*23.5	16.9	(S)	13.5

See footnotes at end of table.



**Table 7. Materials Consumed by Kind: 1982 and 1977—Con.**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 material code	Material	1982		1977	
		Quantity <sup>1</sup>	Delivered cost (million dollars)	Quantity <sup>1</sup>	Delivered cost (million dollars)
	<b>INDUSTRY 3523, FARM MACHINERY AND EQUIPMENT—Con.</b>				
	Mill shapes and forms, except castings and forgings—Con.				
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil .....million lb..	**3.8	2.9	**9.9	6.7
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ....do..	*4.0	4.4	**15.2	10.7
335008	All other aluminum mill shapes and forms (wire rolled rod and bar, powder, welded tubing, etc.) .....do..	(S)	1.2	(S)	4.1
346901	Metal stampings .....do..	(X)	68.0	(X)	48.2
339915	Metal powders .....million lb..	(S)	.6	16.0	3.5
331051	Pig iron, excluding silvery iron .....1,000 s tons..	*20.0	4.6	31.3	5.9
190023	Iron and steel scrap, excluding home scrap .....do..	65.4	19.2	166.1	18.8
	Castings (rough and semifinished):				
332011	Iron (gray and malleable):				
	Purchased .....do..	*242.4	219.4	421.2	371.4
	Produced and consumed .....do..	(D)	(X)	(S)	(X)
332045	Steel:				
	Purchased .....do..	**90.5	41.4	18.0	20.7
	Produced and consumed .....do..	-	(X)	(S)	(X)
336100	Aluminum and aluminum-base alloy:				
	Purchased .....million lb..	*10.7	18.3	(S)	15.9
	Produced and consumed .....do..	-	(X)	(S)	(X)
336200	Copper and copper-base alloy:				
	Purchased .....do..	(S)	5.7	(X)	(?)
	Produced and consumed .....do..	-	(X)	(X)	(X)
336902	Other nonferrous:				
	Purchased .....do..	16.7	5.9	(X)	(?)
	Produced and consumed .....do..	(Z)	(X)	(X)	(X)
346200	Iron and steel forgings:				
	Purchased .....1,000 s tons..	**56.7	89.9	*99.0	96.9
	Produced and consumed .....do..	(D)	(X)	(S)	(X)
349301	Steel springs, except wire .....do..	*7.7	9.9	(X)	(?)
349421	Fluid power (hydraulic and pneumatic) valves .....do..	(X)	25.4	(X)	(?)
349461	Fluid power (hydraulic and pneumatic) hose or tube fittings and assemblies .....do..	(X)	30.5	(X)	(?)
	Engines:				
351920	Diesel and semidiesel:				
	Purchased .....thousands..	94.7	381.0	199.6	432.3
	Produced and consumed .....do..	-	(X)	(S)	(X)
351901	Gasoline and other carburetor:				
	Purchased .....do..	**160.6	27.3	163.9	42.7
	Produced and consumed .....do..	(D)	(X)	(S)	(X)
362115	Electric motors and generators:				
	Fractional horsepower electric motors (less than 1 hp), excluding timing motor: .....do..	(S)	12.3	**226.6	11.1
	Produced and consumed .....do..	-	(X)	(S)	(X)
362120	Integral horsepower motors and generators (1 hp or more): .....do..	(S)	11.7	*205.1	23.0
	Produced and consumed .....do..	(D)	(X)	(S)	(X)
	Bearings:				
356218	Ball .....do..	(X)	63.7	(X)	57.5
356201	Roller .....do..	(X)	34.6	(X)	43.2
356810	Plain bearings and bushings .....do..	(X)	15.9	(X)	16.6
356601	Speed changers, drives, gears, and industrial high speed drives .....do..	(X)	124.6	(X)	121.9
	Pumps (complete assemblies):				
356120	Hydraulic fluid power pumps, motors, and hydrostatic transmissions .....thousands..	*823.9	99.7	(?)	(?)
356102	Other pumps .....do..	(S)	9.0	*592.1	*49.4
356301	Air and gas compressors, except refrigeration compressors .....do..	(D)	(10)	(S)	7.8
356921	Filters for hydraulic fluid power systems .....do..	(X)	(10)	(X)	(?)
359921	Fluid power (hydraulic and pneumatic) cylinders and rotary actuators .....do..	(X)	32.5	(X)	(?)
359922	Hydraulic and pneumatic equipment, except pumps, compressors, valves, cylinders, and rotary actuators .....do..	(X)	45.0	(X)	*95.4
369401	Engine electrical equipment, spark plugs, magnetos, generators, starters, etc. ....do..	(X)	65.7	(X)	61.7
359225	Pistons, piston rings, carburetors, and valves (intake and exhaust only) .....do..	(X)	(10)	(X)	(?)
301101	Pneumatic tires and inner tubes .....thousands..	*3 763.0	192.5	5 660.0	208.4
301131	Semi-pneumatic tires .....do..	*2 000.0	11.8	(D)	(?)
242101	Rough and dressed lumber .....million bd ft..	(S)	9.1	(D)	(?)
285101	Paints, varnishes, lacquers, shellacs, japans, enamels, and allied products .....1,000 gal..	*5 023.9	36.3	*5 113.2	29.5
304101	Rubber and plastics hose and belting .....do..	(X)	33.5	(X)	(?)
306902	Fabricated rubber products, except tires, tubes, hoses, beltings, and gaskets .....do..	(X)	32.4	(X)	29.9
307902	Fabricated plastics products, except gaskets .....do..	(X)	41.9	(X)	24.8
345001	Boils, nuts, screws, rivets, and screw machine products .....do..	(X)	87.8	(X)	96.3
349681	Wire chain .....do..	(X)	2.1	(X)	(?)
354501	Cutting tools for machine tools .....do..	(X)	17.5	(X)	(?)
970099	All other materials and components, parts, containers, and supplies .....do..	(X)	101 445.2	(X)	71 648.3
971000	Materials, parts, containers, and supplies, n.s.k. <sup>2</sup> .....do..	(X)	795.4	(X)	550.3
	<b>INDUSTRY 3524, LAWN AND GARDEN EQUIPMENT</b>				
	Materials, parts, containers, and supplies .....do..	(X)	1 301.4	(X)	909.1
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes .....1,000 s tons..	*48.7	21.3	*32.9	14.6
331012	Sheet and strip .....do..	*147.6	65.7	118.8	49.9
331013	Plates .....do..	**2.0	1.0	(S)	1.9
331015	Structural shapes .....do..	*2.7	2.2	(S)	1.7

See footnotes at end of table.



**Table 7. Materials Consumed by Kind: 1982 and 1977—Con.**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 material code	Material	1982		1977	
		Quantity <sup>1</sup>	Delivered cost (million dollars)	Quantity <sup>1</sup>	Delivered cost (million dollars)
	<b>INDUSTRY 3524, LAWN AND GARDEN EQUIPMENT—Con.</b>				
	Mill shapes and forms, except castings and forgings—Con.				
	Carbon steel—Con.				
331017	Wire and wire products ..... 1,000 s tons..	(S)	1.4	**6.9	4.0
331019	All other carbon steel mill shapes and forms .....	**9.7	4.6	(S)	6.2
331021	Alloy steel, except stainless:				
331029	Bars and bar shapes .....	(S)	3.9	(S)	.3
	All other alloy steel mill shapes and forms .....			(D)	( <sup>11</sup> )
	Stainless steel mill shapes and forms:				
331033	Sheet and strip .....	(D)	(D)	(D)	( <sup>11</sup> )
331050	All other stainless steel mill shapes and forms .....	(D)	(D)	(S)	<sup>11</sup> 10.2
335102	Copper and copper-base alloy:				
	Rod, bar, and mechanical wire, including extruded and/or drawn shapes ..... million lb..	(S)	.5	(D)	( <sup>12</sup> )
335143	Plate, sheet, and strip, including military cups and discs .....			(S)	-
335152	Pipe and tube .....			(S)	<sup>12</sup> 1.1
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil .....	(S)	7.6	( <sup>13</sup> )	( <sup>13</sup> )
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ....			<sup>13</sup> 9.7	<sup>13</sup> 5.7
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) .....			(S)	5.6
346901	Metal stampings .....	(X)	32.2	(X)	29.1
339915	Metal powders ..... million lb..	*7.7	9.8	(S)	7.3
331051	Pig iron, excluding silvery iron ..... 1,000 s tons..	(D)	(D)	-	-
190023	Iron and steel scrap, excluding home scrap .....	(D)	(D)	(D)	(D)
	Castings (rough and semifinished):				
332011	Iron (gray and malleable):				
	Purchased .....	*9.4	10.7	(S)	16.3
	Produced and consumed .....	-	(X)	-	(X)
332045	Steel:				
	Purchased .....	(S)	3.5	1.0	.8
	Produced and consumed .....	-	(X)	-	(X)
336100	Aluminum and aluminum-base alloy:				
	Purchased ..... million lb..	**52.3	33.5	*31.0	20.1
	Produced and consumed .....	(D)	(X)	(D)	(X)
336200	Copper and copper-base alloy:				
	Purchased .....	(D)	(D)	(X)	( <sup>14</sup> )
	Produced and consumed .....	-	(X)	(X)	(X)
336902	Other nonferrous:				
	Purchased .....	18.6	5.6	(X)	( <sup>14</sup> )
	Produced and consumed .....	-	(X)	(X)	(X)
346200	Iron and steel forgings:				
	Purchased ..... 1,000 s tons..	**1.5	2.8	(S)	2.9
	Produced and consumed .....	-	(X)	-	(X)
349301	Steel springs, except wire .....	(S)	.6	(X)	( <sup>14</sup> )
349421	Fluid power (hydraulic and pneumatic) valves .....	(X)	2.2	(X)	( <sup>14</sup> )
349461	Fluid power (hydraulic and pneumatic) hose or tube fittings and assemblies .....	(X)	.9	(X)	( <sup>14</sup> )
	Engines:				
351920	Diesel and semidiesel:				
	Purchased ..... thousands..	(S)	11.5	(D)	(D)
	Produced and consumed .....	-	(X)	-	(X)
351901	Gasoline and other carburetor:				
	Purchased .....	*3 348.3	294.1	4 718.0	285.0
	Produced and consumed .....	-	(X)	-	(X)
362115	Electric motors and generators:				
	Fractional horsepower electric motors (less than 1 hp), excluding timing motor:				
	Purchased .....	354.5	3.5	3 358.0	12.2
	Produced and consumed .....	-	(X)	-	(X)
362120	Integral horsepower motors and generators (1 hp or more):				
	Purchased .....	(D)	(D)	(D)	(D)
	Produced and consumed .....	-	(X)	-	(X)
	Bearings:				
356218	Ball .....	(X)	7.7	(X)	5.5
356201	Roller .....	(X)	4.1	(X)	3.6
356810	Plain bearings and bushings .....	(X)	16.1	(X)	5.2
356601	Speed changers, drives, gears, and industrial high speed drives .....	(X)	(D)	(X)	29.6
	Pumps (complete assemblies):				
356120	Hydraulic fluid power pumps, motors, and hydrostatic transmissions ..... thousands..	**114.0	10.1	(D)	(D)
356102	Other pumps .....	(D)	(D)	(D)	(D)
356301	Air and gas compressors, except refrigeration compressors .....	(X)	-	(D)	(D)
356921	Filters for hydraulic fluid power systems .....	(X)	(D)	(X)	( <sup>9</sup> )
359921	Fluid power (hydraulic and pneumatic) cylinders and rotary actuators .....	(X)	1.7	(X)	( <sup>9</sup> )
359922	Hydraulic and pneumatic equipment, except pumps, compressors, valves, cylinders, and rotary actuators .....	(X)	(D)	(X)	*6.3
369401	Engine electrical equipment, spark plugs, magnetos, generators, starters, etc. ....	(X)	7.8	(X)	10.5
359225	Pistons, piston rings, carburetors, and valves (intake and exhaust only) .....	(X)	(D)	(X)	3.4
301101	Pneumatic tires and inner tubes ..... thousands..	(S)	26.6	**8 165.0	<sup>15</sup> 28.3
301131	Semipneumatic tires .....	*14.2	11.1	( <sup>14</sup> )	( <sup>14</sup> )
242101	Rough and dressed lumber ..... million bd ft..	(S)	1.3	( <sup>14</sup> )	( <sup>14</sup> )
285101	Paints, varnishes, lacquers, shellacs, japans, enamels, and allied products ..... 1,000 gal..	(S)	6.1	779.5	5.0
304101	Rubber and plastics hose and belting .....	(X)	7.0	(X)	( <sup>14</sup> )
306902	Fabricated rubber products, except tires, tubes, hoses, beltings, and gaskets .....	(X)	6.4	(X)	4.3
307902	Fabricated plastics products, except gaskets .....	(X)	41.9	(X)	25.9

See footnotes at end of table.



**Table 7. Materials Consumed by Kind: 1982 and 1977—Con.**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1982 material code	Material	1982		1977	
		Quantity <sup>1</sup>	Delivered cost (million dollars)	Quantity <sup>1</sup>	Delivered cost (million dollars)
	<b>INDUSTRY 3524, LAWN AND GARDEN EQUIPMENT—Con.</b>				
345001	Bolts, nuts, screws, rivets, and screw machine products -----	(X)	26.5	(X)	23.6
349681	Wire chain -----	(X)	(D)	(X)	( <sup>14</sup> )
354501	Cutting tools for machine tools -----	(X)	(D)	(X)	( <sup>14</sup> )
970099	All other materials and components, parts, containers, and supplies -----	(X)	339.2	(X)	<sup>14</sup> 249.1
971000	Materials, parts, containers, and supplies, n.s.k. <sup>2</sup> -----	(X)	222.2	(X)	32.6

<sup>1</sup>For some establishments, data have been estimated from central unit values which are based on quantity-cost relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: \* 10 to 19 percent estimated; \*\* 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).

<sup>2</sup>Total cost of materials of establishments that did not report detailed materials data, including establishments that were not mailed a form.

<sup>3</sup>For 1977, material code 336100 was combined with material code 336200 to avoid disclosing data for individual companies.

<sup>4</sup>For 1977, the delivered costs for material codes 336902, 304101, 329300, 307902, 265001, and 351903 were included with material code 970099.

<sup>5</sup>For 1977, data for aluminum and aluminum-base alloy refinery shapes and scrap (excluding home scrap) were included in the total. Separate data for these items were withheld to avoid disclosing data for individual companies.

<sup>6</sup>For 1982, delivered cost for material code 362120 is combined with material code 970099.

<sup>7</sup>For 1977, the delivered costs for material codes 336200, 336902, 349301, 349421, 349461, 359225, 301131, 242101, 304101, 349681, and 354501 were included with material code 970099.

<sup>8</sup>For 1977, material code 359225 was included with material code 970099 to avoid disclosing data for individual companies.

<sup>9</sup>For 1977, material code 356120 was included with material code 356102; parts for pumps were also included in the 1977 figure.

<sup>10</sup>For 1977, material codes 356921 and 359921 were included with material code 359922.

<sup>11</sup>For 1982, material codes 356301, 356921, and 359225 are combined with material code 970099 to avoid disclosing data for individual companies.

<sup>12</sup>For 1977, material codes 331029 and 331033 were combined with material code 331050 to avoid disclosing data for individual companies.

<sup>13</sup>For 1977, material codes 335102 and 335152 were combined to avoid disclosing data for individual companies.

<sup>14</sup>For 1977, material code 335301 was included with material code 335405 to avoid disclosing data for individual companies.

<sup>15</sup>For 1977, the delivered costs for material codes 336200, 336902, 349301, 349421, 349461, 301131, 242101, 304101, 349681, and 354501 were included with material code 970099.

<sup>16</sup>For 1977, material code 301101 represents pneumatic tires only; separate data for inner tubes were withheld to avoid disclosing data for individual companies. 1977 data for inner tubes were included in the total.



# APPENDIX A.

## Explanation of Terms

This appendix is in two sections. Section 1 includes items which were requested of all establishments that were mailed census of manufactures forms including annual survey of manufactures (ASM) forms. Note that this section also includes several items (number of establishments and companies, value added, classes of products, and specialization and coverage ratios) that were not included on the report forms but were derived from information collected on the forms. Section 2 covers supplementary items that were requested only from establishments included in the ASM sample. Results of the supplementary ASM inquiries are included in tables 3c and 3d of this report.

### SECTION 1. ITEMS COLLECTED OR DERIVED BASED ON ALL CENSUS OF MANUFACTURES (INCLUDING ASM) REPORT FORMS

**Number of establishments and companies**—As discussed in the Introduction, a separate report was required for each manufacturing establishment (plant) with one employee or more. An establishment is defined as a single physical location where manufacturing is performed. A company, on the other hand, is defined as a business organization consisting of one establishment or more under common ownership or control.

If the company operates at different physical locations, even if the individual locations are producing the same line of goods, a separate report was requested for each location. If the company operates in two or more distinct lines of manufacturing at the same location, a separate report was requested for each activity.

An establishment not in operation for any portion of the year was requested to return the report form with the proper notation in the "Operational Status" section of the form. In addition, the establishment was requested to report data on the number of custodial employees, capital expenditures, inventories, or any shipments from inventories during the portion of the year the plant was in operation.

In this report, data are shown for establishments in operation at any time during the year. A comparison with the number of establishments in operation at the end of the year will be provided in the Introduction to Part 1 of the General Summary subject report.

**Employment and related items**—The regular report forms requested separate information on production workers as of a payroll period for each quarter of the year and on other employees as of the payroll period which included the 12th of March.

**All employees**—This item includes all full-time and part-time employees on the payrolls of operating manufacturing establishments during any part of the pay period ending nearest the 12th of the months specified on the report form. Included are all persons on paid sick leave, paid holidays, and paid vacations during these pay periods. Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employees" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average for the payroll periods including the 12th of March, May, August, and November.

**Production workers**—This item includes workers (up through the line-supervisor level) engaged in fabricating, processing, assembling, inspecting, receiving, storing, handling, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial and guard services, product development, auxiliary production for plant's own use (e.g., power plant), recordkeeping, and other services closely associated with these production operations at the establishment covered by the report. Employees above the working-supervisor level are excluded from this item.

**All other employees**—This item covers nonproduction employees of the manufacturing establishment including those engaged in factory supervision above the line-supervisor level. It includes sales (including driver salespersons), sales delivery (highway truck drivers and their helpers), advertising, credit, collection, installation and servicing of own products, clerical and routine office function, executive, purchasing, financing, legal, personnel (including cafeteria, medical, etc.), professional, and technical employees. Also included are employees on the payroll of the manufacturing establishment who are engaged in the construction of major additions or alterations to the plant and who are utilized as a separate work force.

In addition to reports sent to operating manufacturing establishments, information on employment during the payroll period which included March 12 and annual payrolls was also requested of auxiliary units (e.g., administrative offices, warehouses, and research and development laboratories) of multiestablishment companies. However, these figures are not included in the totals for individual industries shown in this report. They are included in the general summary and geographic area reports and in the final bound volumes as a separate category.

**Payrolls**—This item includes the gross earnings of all employees on the payroll of operating manufacturing establishments paid in the calendar year 1982. Respondents were told they could follow the definition of payrolls used for calculating the Federal withholding tax. It includes all forms of compensation, such as salaries, wages, commissions, dismissal pay, all bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. The total includes salaries of officers



of corporations, but excludes payments to proprietors or partners of unincorporated concerns. Also excluded are payments to members of Armed Forces and pensioners carried on the active payroll of manufacturing establishments.

The census definition of payrolls is identical to that recommended to all Federal statistical agencies by the Office of Management and Budget. It should be noted that this definition does not include employers' Social Security contributions or other nonpayroll labor costs, such as employees' pension plans, group insurance premiums, and workers' compensation.

The ASM provides estimates of employers' supplemental labor costs, both those required by Federal and State laws and those incurred voluntarily or as part of collective bargaining agreements. (Supplemental labor costs are explained later in this appendix.)

As in the case of employment figures, the payrolls of separate auxiliary units of multiestablishment companies are not included in the totals for individual industries or industry groups.

**Production-worker hours**—This item covers hours worked or paid for at the plant, including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave.

**Cost of materials**—This term refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuel consumed, whether purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (1) all raw materials, semifinished goods, parts, components, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year, (2) electric energy purchased, (3) fuels consumed for heat, power, or the generation of electricity, (4) work done by others on materials or parts furnished by manufacturing establishments (contract work), and (5) products bought and resold in the same condition. (See discussion of duplication of data below.)

**Specific materials consumed**—In addition to the total cost of materials, which every establishment was required to report, information was also collected for most manufacturing industries on the consumption of major materials used in manufacturing. The inquiries were restricted to those materials which were important parts of the cost of production in a particular industry and for which cost information was available from manufacturers' records. Information on the specific materials consumed is shown in table 7 if appropriate to the industry. Establishments consuming less than a specified amount (usually \$10,000) of a specific material were not requested to report consumption of that material separately. Also, the cost of materials for the small establishments for which either administrative records or short forms were used was imputed as "not specified by kind." (See the Introduction for the importance of administrative records in the industry.)

**Value of shipments**—This item covers the received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts, such as receipts for contract work performed for others, installation and repair, sales of scrap, and sales of products bought and resold without further

processing. Included are all items made by or for the establishments from materials owned by it, whether sold or transferred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value, including not only the direct cost of production but also a reasonable proportion of "all other costs" (including company overhead) and profit. (See discussion of duplication of data below.)

**Individual products**—As in previous censuses, data were collected for almost all industries on the quantity and value of individual products shipped. In the 1982 census program, information was collected on the output of approximately 11,000 individual product items. The term "product," as used in the census of manufactures, represents the finest level of detail for which output information was requested. Consequently, it is not necessarily synonymous with the term "product" as used in the marketing sense. In some cases it may be much more detailed and, in other cases, it is more aggregative. For example, "pharmaceutical preparations" was distributed into over 100 items; whereas, "motor gasoline" was reported as a single item.

Approximately 6,000 of the product items were listed separately on the 1982 census report forms. Data for about 5,000 products were obtained in the monthly, quarterly, or annual surveys comprising the Current Industrial Reports series of the Census Bureau. Totals for the year 1982 for these items, as derived from the commodity surveys, are shown in the "products shipped" table (table 6a) together with the tieline total value collected in the census for reconciliation purposes.

The list of products for which separate information was collected was prepared after consultation with industry and government representatives. Comparability with previous figures was given considerable weight in the selection of product categories so that comparable 1977 information is presented for most products.

Typically, both quantity and value of shipments information was collected. However, if quantity was not significant or could not be reported by manufacturers, only value of shipments was collected.

Shipments include both commercial shipments and transfers of products to other plants of the same company. For industries in which a considerable portion of the total shipments is transferred to other plants of the same company, separate information on interplant transfers was also collected. Moreover, for products that are used to a large degree within the same establishment as materials or components in the fabrication of other products, total production and often consumption of the item within the plant was collected. Typically, the information on production was also collected for products for which there are significant differences between total production and shipments in a given year because of wide fluctuations in finished goods inventories. Other measures of output of products with long production cycles were used as appropriate and feasible.

**Classes of products**—To summarize the product information, the separate products were aggregated into classes of products that, in turn, were grouped into all primary products of each industry. The code structure used is a seven-digit number for the



individual product, a five-digit number for the class of product, and a four-digit number for the total primary products in an industry. (See Introduction, Industry Classification of Establishments, for application of the coding structure to the assignment of SIC codes for establishments.)

In the 1982 census, the 11,000 products were grouped into approximately 1,500 separate classes on the basis of general similarity of manufacturing processes, types of materials used, and the like. However, the grouping of products was affected by the economic significance of the class and, in some cases, dissimilar products were grouped because the products were not sufficiently significant to warrant separate classes.

**Duplication in cost of materials and value of shipments**—The aggregate of the cost of materials and value of shipments figures for industry groups and for all manufacturing industries includes large amounts of duplication, since the products of some industries are used as materials by others. With some important exceptions, such as for motor vehicles and parts, this duplication is not significant at the four-digit industry level. However, it is significant at the two-digit and three-digit industry group level because these totals often include industries that represent successive stages in the production of a finished manufactured product. Examples are the addition of flour mills to bakeries in the "Food" group and the addition of pulp mills to paper mills in the "Paper and Allied Products" group of industries. Estimates of the overall extent of this duplication indicate that the value of manufactured products exclusive of such duplication (the value of finished manufactures) tends to approximate two-thirds of the total value of products reported in the census of manufactures.

**Value added by manufacture**—This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments (products manufactured plus receipts for services rendered). The result of this calculation is adjusted by the addition of value added by merchandising operations (i.e., the difference between the sales value and the cost of merchandise sold without further manufacture, processing, or assembly) plus the net change in finished goods and work-in-process between the beginning- and end-of-year inventories.

Because of the change in instructions for reporting inventories for 1982, the 1982 figure for value added is not strictly comparable to prior-year data. This is explained more fully in the inventories section below.

"Value added" avoids the duplication in the figure for value of shipments that results from the use of products of some establishments as materials by others. Value added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

**New and used capital expenditures**—For establishments in operation and establishments under construction but not yet in operation, manufacturers were asked to report their new expenditures for (1) permanent additions and major alterations to manufacturing establishments, and (2) machinery and equipment used for replacement and additions to plant capacity if they were of the type for which depreciation accounts were ordinarily maintained.

The totals for new expenditures exclude that portion of expenditures leased from nonmanufacturing concerns, new facilities owned by the Federal Government but operated under

contract by private companies, and plant and equipment furnished to the manufacturer by communities and nonprofit organizations. Also excluded are expenditures for used plant and equipment (although reported in the census), expenditures for land, and cost of maintenance and repairs charged as current operating expenses.

Manufacturers were also requested to report the value of all used buildings and equipment purchased during the year at the purchase price. For any equipment or structure transferred to the use of the reporting establishment by the parent company or one of its subsidiaries, the value at which it was transferred to the establishment was to be reported. Furthermore, if the establishment changed ownership during the year, the cost of the fixed assets (building and equipment) was to be reported under used capital expenditures.

Total expenditures for used plant and equipment is a universe figure; i.e., it is collected on all census forms. However, the breakdown of this figure between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form and is subject to sampling error (see table 3d). The data for total new capital expenditures, new building expenditures, and new machinery expenditures, as well as the data for total used expenditures, are shown in both tables 3a and 3d. The figure in table 3a is a census universe total and may differ from the results of the ASM sample shown in table 3d. Since the figures in table 3d are subject to sampling error, they are not considered as reliable as the universe figures.

**End-of-year inventories**—Respondents were asked to report their 1981 and 1982 end-of-year inventories at cost or market. Effective with the 1982 Economic Censuses, this change to a uniform instruction for reporting inventories was introduced for all sector reports. Prior to 1982, respondents were permitted to value inventories using any generally accepted accounting method (FIFO, LIFO, market, to name a few). In 1982, LIFO users were asked to first report inventory values prior to the LIFO adjustment and then to report the LIFO reserve and the LIFO value after adjustment for the reserve.

Because of this change in reporting instructions, the 1982 data for inventories and value added by manufacture included in the tables of this report are not comparable to the prior-year data shown in table 1a of this report and in historical census of manufactures and annual survey of manufactures publications. Inventories and value added data estimated on a basis comparable to the historical data, using the reported information for 1982, are shown in footnote 4 of table 1a. However, the end-of-1981 figure shown in this footnote may differ from the corresponding value published as part of the 1981 Annual Survey of Manufactures.

This difference at the four-digit SIC level is due primarily to the effects of industry shifts. As described in the Industry Classification of Establishments section of the Introduction, ASM noncertainty plants are allowed to shift from one industry to another in a census year; whereas, they are "frozen" in a particular industry in ASM years. Other explanations for this difference include the effects of sampling and processing errors and revisions to end-of-1981 data reported by respondents.

In using inventory data by stage of fabrication for "all industries" and at the two-digit industry level, it should be noted that an item treated as a finished product by an establishment in one industry may be reported as a raw material by another establishment in a different industry. For example, the finished-product inventories of a steel mill would be reported as raw



materials by a stamping plant. Such differences are present in the inventory figures by stage of fabrication shown for individual industries, industry groups, and "all manufacturing," which are aggregates of figures reported by establishments in specified industries.

**Specialization and coverage ratios**—These items are not collected on the report forms but are derived from the data shown in table 5b. An establishment is classified in a particular industry if its shipments of primary products of that industry exceed in value its shipments of the products of any other single industry.

As noted in the Introduction, an establishment's shipments include those products assigned to an industry (primary products), those considered primary to other industries (secondary

products), and receipts for miscellaneous activities (merchandising, contract work, resales, etc.). Specialization and coverage ratios have been developed to measure the relationship of primary product shipments to the data on shipments for the industry shown in tables 1a through 5a and data on product shipments shown in tables 6a through 6c.

**Specialization ratio** represents the ratio of primary product shipments to total product shipments (primary and secondary excluding miscellaneous receipts) for the establishments classified in the industry.

**Coverage ratio** represents the ratio of primary products shipped by the establishments classified in the industry to the total shipments of such products that are shipped by all manufacturing establishments wherever classified.

## SECTION 2. ITEMS COLLECTED ONLY ON ASM REPORT FORMS

**Supplemental labor costs**—Supplemental labor costs are divided into legally required expenditures and payments for voluntary programs. The legally required portion consists primarily of Federal old age and survivors' insurance, unemployment compensation, and workers' compensation. Payments for voluntary programs include all programs not specifically required by legislation whether they were employer initiated or the result of collective bargaining. They include the employer portion of such plans as insurance premiums, premiums for supplemental accident and sickness insurance, pension plans, supplemental unemployment compensation, welfare plans, stock purchase plans on which the employer payment is not subject to withholding tax, and deferred profit-sharing plans. They exclude such items as company-operated cafeterias, in-plant medical services, free parking lots, discounts on employee purchases, and uniforms and work clothing for employees. While the excluded items do benefit employees and all or part of their cost generally is similar to the items covered in the ASM labor costs statistics, accounting records do not generally provide reliable figures on net employee benefits of these types.

**Cost of purchased services**—ASM establishments were requested to provide information on the cost of purchased services for the repair of buildings and other structures, the repair of machinery, and communication services. Included in the cost of purchased services for the repair of buildings and machinery are payments made for all maintenance and repair work on buildings and equipment, such as painting, roof repairs, replacing parts, and overhauling equipment. Such payments made to other establishments of the same company and for repair and maintenance of any leased property are also included. Extensive repairs or reconstruction that were capitalized are considered capital expenditures for used buildings and machinery and are, therefore, excluded from this item. Repair and maintenance costs provided by an owner as part of a rental contract or incurred directly by an establishment in using its own work force are also excluded.

The response coverage ratio shown in table 3d for each of the three types of purchased services listed above is a measure of the extent to which respondents reported for each item. It is derived for each item by calculating the ratio of the weighted employment (establishment data multiplied by sample weight; see section 3) for those ASM establishments that reported the

specific inquiry to the weighted total employment for all ASM establishments classified in the industry.

**Electric energy used for heat and power**—Data on the cost of purchased electric energy were collected on all census forms. However, data on the quantity of purchased electric energy and quantity of generated-less-sold electric energy were collected only on the ASM forms. The cost and quantity of purchased electric energy represent the amount actually used during the year for heat and power. In addition, information was collected on the quantity of electric energy generated by the establishment and the quantity of electric energy sold or transferred to other plants of the same company.

**Beginning- and end-of-year depreciable assets**—The data encompass all fixed depreciable assets on the books of establishments at the beginning and at the end of the year. The values shown (book value) represent the actual cost of assets at the time they were acquired, including all costs incurred in making the assets usable (such as transportation and installation). Included are all buildings, structures, machinery, and equipment (production, office, and transportation equipment) for which depreciation reserves are maintained. Excluded are non-depreciable capital assets, including inventories and intangible assets, such as patent rights and royalties. Also excluded are land and depletable assets, such as timber and mineral rights.

The definition of fixed depreciable assets is consistent with the definition of capital expenditures. For example, expenditures include actual capital outlays during the year, rather than the final value of equipment put in place and buildings completed during the year. Accordingly, the value of assets at the end of the year includes the value of construction in progress. In addition, respondents were requested to make certain that assets at the beginning of the year plus new and used capital expenditures, less retirements, equalled assets at the end of the year.

**New and used capital expenditures**—The data for total new capital expenditures, new building expenditures, new machinery expenditures, and total used capital expenditures are collected on all census forms. However, the breakdown between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. (See further explanation on capital expenditures in section 1.)



**Breakdown of new capital expenditures for machinery and equipment**—ASM establishments were requested to separate their capital expenditures for new machinery and equipment into (1) automobiles, trucks, etc., for highway use, (2) computers and peripheral data processing equipment, and (3) all other.

The category "automobiles, trucks, etc., for highway use" is intended to measure expenditures for vehicles designed for highway use that were acquired through a purchase or lease-purchase agreement. Vehicles normally operating off public highways (vehicles specifically designed to transport materials, property, or equipment on mining, construction, logging, and petroleum development projects) are excluded from this item.

The "not specified by kind" or n.s.k. item for expenditures for new machinery and buildings, shown in table 3d, represents the total machinery and equipment expenditures for establishments that did not break down their expenditures for the three specific categories. This means that for most industries the specific categories are understated.

**Retirements**—Included in this item is the gross value of assets sold, retired, scrapped, destroyed, etc., during 1982. When a complete operation or establishment changed ownership, the respondent was instructed to report the value of the assets sold at the original cost as recorded in the books of the seller. The respondent was also requested to report retirements of equipment or structures owned by a parent company that the establishment was using as if it were a tenant.

**Rental payments**—This item includes rental payments for the use of all items for which depreciation reserves would be maintained if they were owned by the establishment, e.g., structures and buildings, and production, office, and transportation equipment. Excluded are royalties and other payments for the use of intangibles and depletable assets, and land rents where separable.

When an establishment of a multiestablishment company was charged rent by another part of the same company for the use of assets owned by the company, it was instructed to exclude that cost from rental payments. However, the book value (original cost) of these company-owned assets was to be reported as assets of the establishment at the end of the year.

If there were assets at an establishment rented from another company, and the rents were paid centrally by the head office of the establishment, the company was instructed to report these rental payments as if they were paid directly by the establishment.

**Depreciation charges**—This item includes depreciation and amortization charged during the year against assets. Depreciation charged against fixed assets acquired since the beginning of the year and against assets sold or retired during the year are components of this category. Respondents were requested to make certain that they did not report accumulated depreciation.



estimates of the publication totals from the ASM mail sample were adjusted by the difference between imputed census totals and the corresponding ASM mail sample estimates of these imputed totals. These imputed totals are obtained by applying industry average ratios to control item values at the establishment level. For example, an imputed total beginning assets figure is obtained by multiplying each establishment's total value of shipments by the industry (four-digit SIC) average for the ratio of beginning assets to shipments.

Separate estimates for the nonmail establishments were not developed. However, their contribution to the publication estimates is reflected in the difference adjustment.

The method of inventory valuation percentages included in table 3c was developed using both complete census information and ASM estimates. The percentages for the four major categories (LIFO, non-LIFO, valuation method not reported, and LIFO reported without associated value and reserve) were derived from the complete census and correspond to the values included in table 3d. The percentages for the specific non-LIFO methods of valuations (FIFO, average cost, specific costs, etc.) are ratio estimates developed from the ASM in conjunction with the census universe estimate for the total of the non-LIFO methods.

## QUALIFICATIONS OF THE DATA

The estimates developed from the sample are apt to differ somewhat from the results of a survey covering all companies in the sampled lists but otherwise conducted under essentially the same conditions as the actual sample survey. The estimates of the magnitude of the sampling errors (the differences between the estimates obtained and the results theoretically obtained from a comparable, complete-coverage survey) are provided by the standard errors of the estimates.

The particular sample selected for the ASM is one of a large number of similar probability samples that, by chance, might have been selected under the same specifications. Each of the possible samples would yield somewhat different sets of results, and the standard errors are measures of the variation of all the possible sample estimates around the theoretical, comparable, complete-coverage values.

Estimates of the standard errors have been computed from the sample data for selected statistics in this report. Except for table 3c, they are presented in the form of relative standard errors, the standard errors divided by the estimated values to which they refer. In table 3c, "absolute" standard errors of the estimates are presented.

In conjunction with its associated estimate, the relative standard error may be used to define confidence intervals (ranges that would include the comparable, complete-coverage value for specified percentages of all the possible samples).

The complete coverage value would be included in the range:

1. From one standard error below to one standard error above the derived estimate for about two-thirds of all possible samples.

2. From two standard errors below to two standard errors above the derived estimate for about 19 out of 20 of all possible samples.
3. From three standard errors below to three standard errors above the derived estimate for nearly all samples.

An inference that the comparable, complete-survey result would be within the indicated ranges would be correct in approximately the relative frequencies shown. Those proportions, therefore, may be interpreted as defining the confidence that the estimates from a particular sample would differ from complete-coverage results by as much as one, two, or three standard errors, respectively.

For example, suppose an estimated total is shown as 50,000 with an associated relative standard error of 2 percent, that is, a standard error of 1,000 (2 percent of 50,000). There is approximately 67 percent confidence that the interval 49,000 to 51,000 includes the complete-coverage total and about 95 percent confidence that the interval 48,000 to 52,000 includes the complete-coverage total.

In addition to the sample errors, the estimates are subject to various response and operational errors: errors of collection, reporting, coding, transcription, imputation for nonresponse, etc. These operational errors would also occur if a complete canvass were to be conducted under the same conditions as the survey.

Explicit measures of their effects generally are not available. However, it is believed that most of the important operational errors were detected and corrected in the course of the Bureau's review of the data for reasonableness and consistency. The small operational errors usually remain. To some extent, they are compensating in the aggregated totals shown. When important operational errors were detected too late to correct the estimates, the data were suppressed or were specifically qualified in the tables.

As derived, the estimated standard errors included part of the effect of the operational errors. The total errors, which depend upon the joint effect of the sampling and operational errors, are usually of the order of size indicated by the standard error, or only moderately higher. However, for particular estimates, the total error may considerably exceed the standard errors shown.

The concept of complete coverage under the conditions prevailing for the ASM is not identical to the complete coverage of the census of manufactures, as the censuses have been conducted. Nearly all types of operational errors that affect the ASM also occur in the censuses. The ASM and the censuses, are conducted under quite different conditions, and operational errors can be better controlled in the ASM than in the censuses. As a result, for many of the census figures, the errors are of the same order of size as the total errors of the corresponding annual survey estimates. The differences between the census and ASM operating conditions also disturb, to some degree, the comparability of the ASM and census data.

Any figures shown in the tables in this publication having an associated standard error exceeding 15 percent may be of limited reliability. However, the figure may be combined with higher-level totals, creating a broader aggregate, which then may be of acceptable reliability.



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## 1982 CENSUS OF MANUFACTURES

Publications of the 1982 Census of Manufactures, containing preliminary and final data on manufacturing establishments in the United States, are described below. Publication order forms for the specific reports may be obtained from any Department of Commerce district office or from Data User Services Division, Customer Services (Publications), Bureau of the Census, Washington, D.C. 20233

### Preliminary Reports

Preliminary industry data are issued in 443 separate reports covering 452 industries (or combinations of industries). Preliminary data for States are grouped and released in reports for each of the nine census geographic divisions.

### Final Reports

Final detailed statistics are issued in separate paperbound reports.

#### Industry series—82 reports (MC82-I-20A to -39D)

Each of the 82 reports provides information for a group of related industries (e.g., "dairy products" includes industries for butter, cheese, milk, etc.). Final figures for the United States are shown for each of the 452 manufacturing industries on quantity and value of products shipped and materials consumed, cost of fuels and electric energy, capital expenditures, assets, rents, inventories, employment, payroll, payroll supplements, hours worked, value added by manufacture, number of establishments, and number of companies. Comparative statistics for earlier years are provided where available.

For each industry, data on value of shipments, value added by manufacture, capital expenditures, employment, and payroll are shown by employment-size class of establishment and degree of primary product specialization. Statistics are given on production of specific products and consumption of energy and various materials by industry.

#### Geographic area series—51 reports (MC82-A-1 to -51)

A separate report for each State and the District of Columbia presents data for industry groups and industries on value of shipments, cost of materials, value added by manufacture, employment, payroll, hours worked, new capital expenditures, and number of manufacturing establishments for the State, SMSA's, and large industrial counties and places. Comparative statistics for earlier census years are shown for the State and large SMSA's. Manufacturing totals are presented for each county and for places with significant manufacturing activity. Detailed statistics—including inventories, assets, rents, and energy costs—are presented only in statewide totals.

#### Subject series—10 reports (MC82-S-1 to -10)

Each of the 10 reports contains detailed statistics for an individual subject, such as: selected materials consumed, selected metalworking

operations, manufacturing activity in government establishments, concentration ratios in manufacturing, type of organization, water use in manufacturing, fuels and electric energy consumed (separate publications for industry statistics, and State and SMSA statistics), textile machinery in place, production indexes, and a general National-level summary.

### Final Report Volumes

Final paperbound reports subsequently are assembled and reissued in clothbound volumes.

- Volume I. Summary and Subject Statistics—data previously issued in series MC82-S.
- Volume II. Industry Statistics—data previously issued in series MC82-I.
  - Part 1. Major Groups 20 to 26
  - Part 2. Major Groups 27 to 34
  - Part 3. Major Groups 35 to 39
- Volume III. Geographic Area Statistics—data previously issued in series MC82-A.
  - Part 1. Alabama to Montana
  - Part 2. Nebraska to Wyoming

### Microfiche

All published data also are available on microfiche.

### Computer Tapes

Selected data—generally detailed information by industry and/or geographic area—also are available on public-use computer tapes. For the selected data, these tapes will provide the same information found in the final reports. Public-use computer tapes are available for users who wish to summarize, rearrange, or process large amounts of data. These tapes, with corresponding technical documentation, are sold by Data User Services Division, Customer Services (Tapes), Bureau of the Census, Washington, D.C. 20233.

## OTHER ECONOMIC CENSUSES REPORTS

Data on retail trade, wholesale trade, service industries, construction industries, mineral industries, enterprise statistics, minority-owned businesses, women-owned businesses, and transportation also are issued as part of the 1982 Economic Censuses. A separate series of reports covers the censuses of outlying areas—Puerto Rico, Virgin Islands of the United States, Guam, and the Northern Mariana Islands. All published reports and microfiche are sold by the Superintendent of Documents, U. S. Government Printing Office. Appropriate announcements and order forms describing these products are available free of charge from Data User Services Division, Customer Services (Publications), Bureau of the Census, Washington, D.C. 20233.



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